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Volume 12 | Number 38 | 14 October 2014 | Pages 7413–7644

Organic & Biomolecular Chemistry

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Catalyst Comics Presents

THE RETURN OF RANEY COBALT



DIHYDROGEN BOY



**THE
DOMINO
REACTION!**

ISSN 1477-0520



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REVIEW ARTICLE

Martin G. Banwell *et al.*

RANEY® cobalt – an underutilised reagent for the selective cleavage of C–X and N–O bonds

Organic & Biomolecular Chemistry

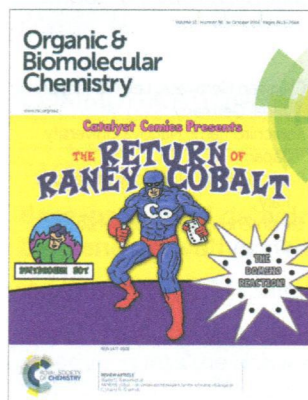
An international journal of synthetic, physical and biomolecular organic chemistry

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IN THIS ISSUE

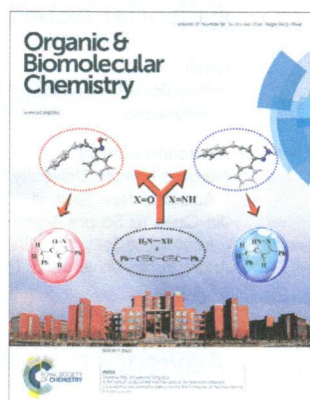
ISSN 1477-0520 CODEN OBCRAK 12(38) 7413–7644 (2014)



Cover

See Martin G. Banwell *et al.*, pp. 7433–7444.

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Inside cover

See Donghui Wei, Mingsheng Tang *et al.*, pp. 7503–7514.

Background image: the main teaching building of new Zhengzhou University, which was founded through the merger of three universities: Zhengzhou University, Zhengzhou University of Technology and Henan Medical University.

Image reproduced by permission of Donghui Wei from *Org. Biomol. Chem.*, 2014, **12**, 7503.

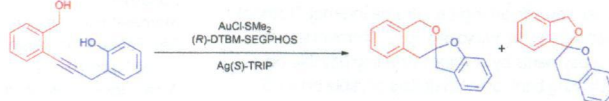
PERSPECTIVE

7423

Recent developments in transition metal-catalysed spiroketalisation

Rachelle Quach, Daniel F. Chorley and Margaret A. Brimble*

This perspective updates recent developments (since 2012) in the synthesis of spiroketals using transition metal catalysis.



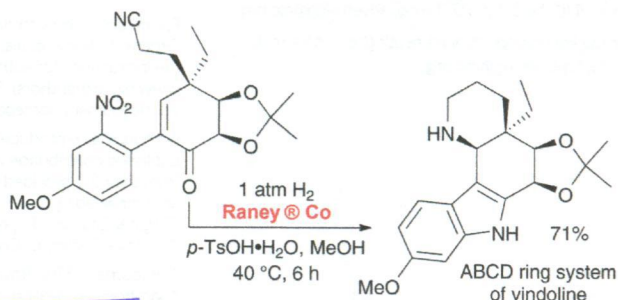
REVIEWS

7433

RANEY® cobalt – an underutilised reagent for the selective cleavage of C–X and N–O bonds

Martin G. Banwell,* Matthew T. Jones, Tristan A. Reekie, Brett D. Schwartz, Shen H. Tan and Lorenzo V. White

The first comprehensive survey of the application of the catalyst RANEY® cobalt in chemical synthesis is presented. Its capacity to effect chemoselective reductive cyclisation reactions under mild conditions is highlighted.



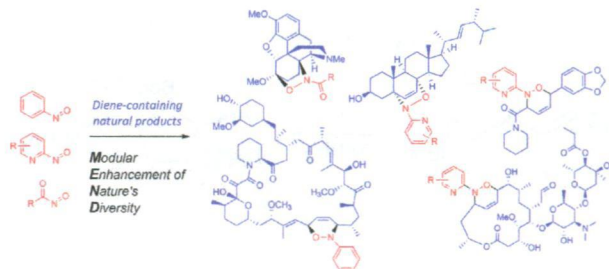
Федеральное государственное
бюджетное учреждение науки
Центральная научная библиотека
Уральского отделения
Российской академии наук (ЦНБ УрО РАН)

7445

Nitroso Diels–Alder (NDA) reaction as an efficient tool for the functionalization of diene-containing natural products

Serena Carosso and Marvin J. Miller*

This review describes the use of nitroso Diels–Alder reactions for the functionalization of complex diene-containing natural products in order to generate libraries of compounds with potential biological activity.



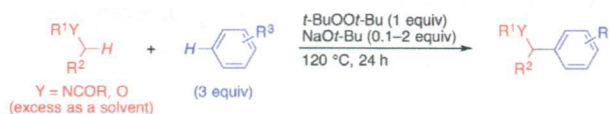
COMMUNICATIONS

7469

Base-promoted dehydrogenative coupling of benzene derivatives with amides or ethers

Ryota Ueno and Eiji Shirakawa*

Electronically neutral and deficient benzene derivatives are introduced into the dehydrogenative coupling as arenes that couple with amides/ethers.

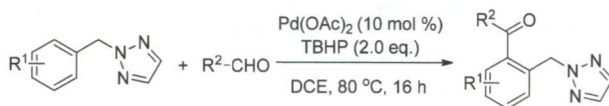


7474

Palladium-catalyzed *ortho*-acylation of 2-benzyl-1,2,3-triazoles with aldehydes

Qingshan Tian, Ping He and Chunxiang Kuang*

A palladium-catalyzed *ortho*-acylation of 2-benzyl-1,2,3-triazoles with aldehydes as an acyl source was developed. A wide variety of ketones containing 1,2,3-triazoles were obtained in good to excellent yields. This methodology provides a convenient access to the acylation of 2-substituted-1,2,3-triazoles.

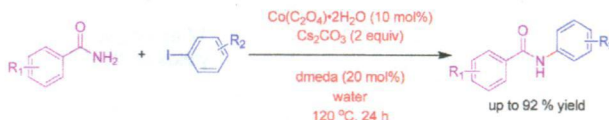


7478

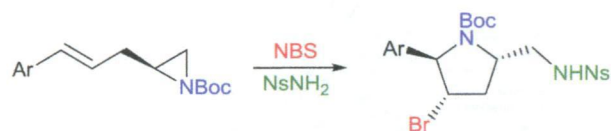
Efficient cobalt-catalyzed C–N cross-coupling reaction between benzamide and aryl iodide in water

Bryan Yong-Hao Tan and Yong-Chua Teo*

A practical and efficient strategy for the N-arylation of benzamide catalysed by a $\text{Co}(\text{C}_2\text{O}_4)_2 \cdot 2\text{H}_2\text{O}$ /dmeda system in water is reported. Under the optimized conditions, a wide variety of N-arylated products were obtained in good yields (up to 92%) using substituted aryl iodides.



7482

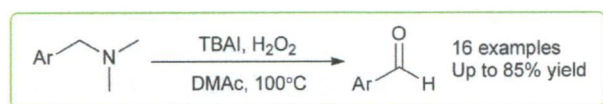


Diastereoselective synthesis of functionalized pyrrolidines through *N*-bromosuccinimide-induced aziridine ring expansion cascade of cinnamylaziridine

Jing Zhou and Ying-Yeung Yeung*

An efficient aziridine ring expansion cascade of cinnamylaziridine has been developed using *N*-bromosuccinimide as the promoter.

7486

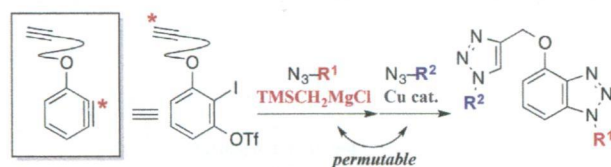


Oxidative cleavage of benzylic C–N bonds under metal-free conditions

Jin-Long Gong, Xinxin Qi, Duo Wei, Jian-Bo Feng and Xiao-Feng Wu*

An interesting and practical metal-free strategy has been developed for the synthesis of aromatic aldehydes using various *N,N*-dimethylbenzylamines as starting materials.

7489

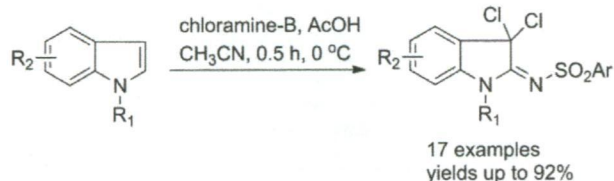


Modular synthesis of bis- and tris-1,2,3-triazoles by permutable sequential azide–aryne and azide–alkyne cycloadditions

Suguru Yoshida, Takako Nonaka, Takamoto Morita and Takamitsu Hosoya*

A new method for aryne generation enabled facile synthesis of diverse bis- and tris-1,2,3-triazoles.

7494



AcOH-mediated dichloroimination of indoles using chloramine-B: a facile access to 2,3-functionalized indolines

Xiaozu Liu, Qinghong Hu, Zeli Yuan* and Peijun Liu*

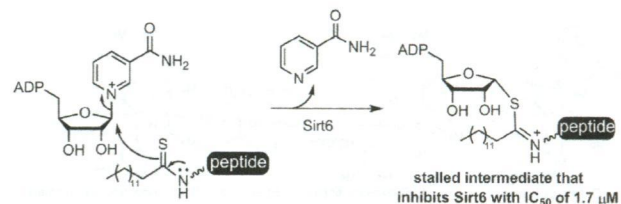
A mild method for the efficient synthesis of 3,3-dichloro-2-sulfonyliminoindolines via AcOH-mediated dichloroimination of indoles using chloramine-B is described.

7498

Thiomyristoyl peptides as cell-permeable Sirt6 inhibitors

Bin He, Jing Hu, Xiaoyu Zhang and Hening Lin*

Potent mechanism-based Sirt6 inhibitors.



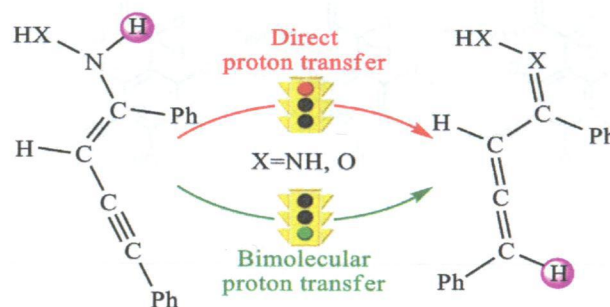
PAPERS

7503

A theoretical study on the mechanisms of the reactions between 1,3-dialkynes and ammonia derivatives for the formation of five-membered N-heterocycles

Yang Wang, Donghui Wei,* Wenjing Zhang, Yanyan Wang, Yanyan Zhu, Yu Jia and Mingsheng Tang*

The reaction mechanisms between 1,3-dialkynes and ammonia derivatives for the formation of five-membered N-heterocycles have been investigated using the DFT method.

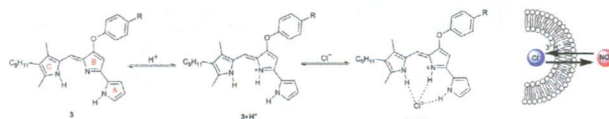


7515

Influence of B-ring modifications on proton affinity, transmembrane anion transport and anti-cancer properties of synthetic prodigiosenes

Estelle Marchal, Soumya Rastogi, Alison Thompson* and Jeffery T. Davis*

We describe how modulating the pK_a of a family of synthetic prodigiosenes, modified on their B-ring, can control the transmembrane transport of anions.

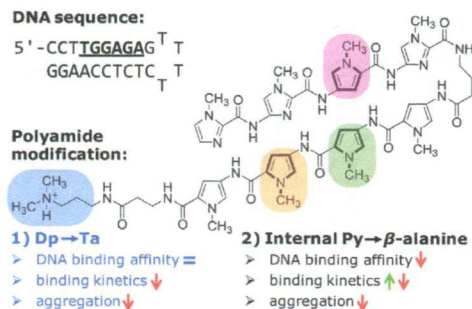


7523

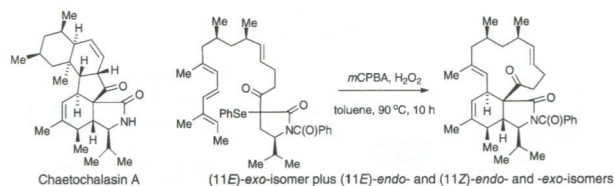
Modulation of DNA–polyamide interaction by β -alanine substitutions: a study of positional effects on binding affinity, kinetics and thermodynamics

Shuo Wang, Karl Aston, Kevin J. Koeller, G. Davis Harris Jr., Nigam P. Rath, James K. Bashkin* and W. David Wilson*

The substitution of an internal pyrrole with a β motif has large and diverse effects on hairpin polyamide–DNA binding affinity, kinetics and binding orientation.



7537

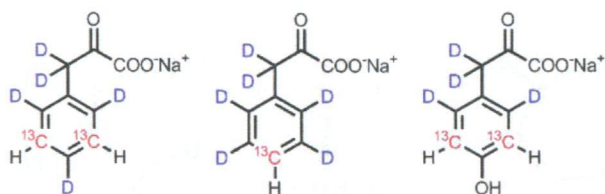


Approaches to the total synthesis of chaetochalasin A

Eric J. Thomas* and Mark Willis

Chaetochalasin A is a complex natural product whose biosynthesis may involve two domino Diels–Alder reactions.

7551

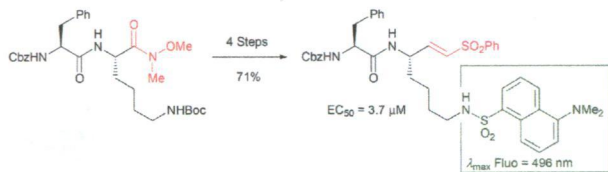


Synthesis of aromatic $^{13}\text{C}/^2\text{H}$ - α -ketoacid precursors to be used in selective phenylalanine and tyrosine protein labelling

R. J. Lichtenecker

A synthetic concept to access various $^{13}\text{C}/^2\text{H}$ patterns of phenylalanine and tyrosine precursors for cell-based protein overexpression systems is presented. The target compounds feature isolated ^{13}C – ^1H spin systems to be used in NMR probing of protein structure and dynamics.

7561

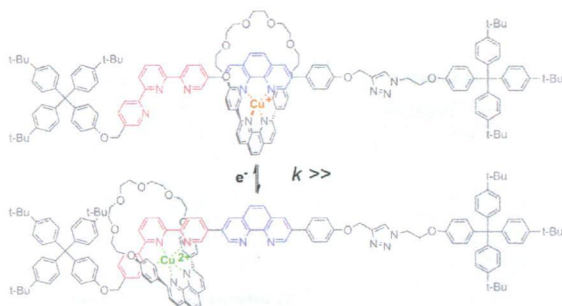


Preparation, anti-trypanosomal activity and localisation of a series of dipeptide-based vinyl sulfones

William Doherty, Jinju James, Paul Evans,* Laura Martin, Nikoletta Adler, Derek Nolan and Andrew Knox

An improved, Weinreb amide-based, synthesis of anti-trypanosomal lysine-containing vinyl sulfones is described incorporating, as a feature, diversity at the ϵ -lysine amino group.

7572



Fast redox-triggered shuttling motions in a copper rotaxane based on a phenanthroline–terpyridine conjugate

Eugenio Coronado, Pablo Gaviña,* Julia Ponce and Sergio Tatay*

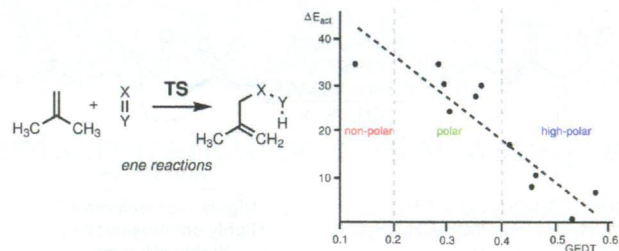
Fast shuttling motions in solution have been observed for a Cu-complexed [2] rotaxane, whose thread contains a bidentate 1,10-phenanthroline chelating unit directly connected through its 3-position to the 5-position of a tridentate 2,2':6',2''-terpyridine.

7581

Understanding the polar mechanism of the ene reaction. A DFT study

Luis R. Domingo,* Maria J. Aurell and Patricia Pérez

A good correlation between the activation energy and global electron density transfer at the transition structure of ene reactions has been found. The proposed polar mechanism can be easily predicted analysing the electrophilicity/nucleophilicity indices of the reagents.

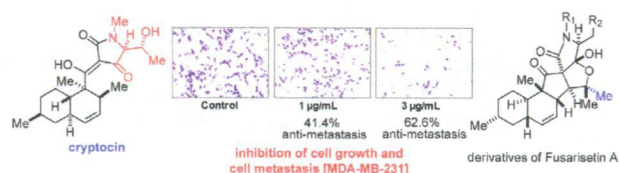


7591

Total synthesis and biological studies of cryptocin and derivatives of equisetin and fusarisetin A

Lili Kong, Mingjin Rao, Jinjie Ou, Jun Yin, Weiqiang Lu, Mingyao Liu, Xiufeng Pang* and Shuanhu Gao*

Total synthesis of cryptocin, derivatives of equisetin and fusarisetin A were achieved based on the biosynthetic hypothesis. The biological studies of their inhibitory effects on breast cancer cells (MDA-MB-231) survival and metastasis were further investigated.

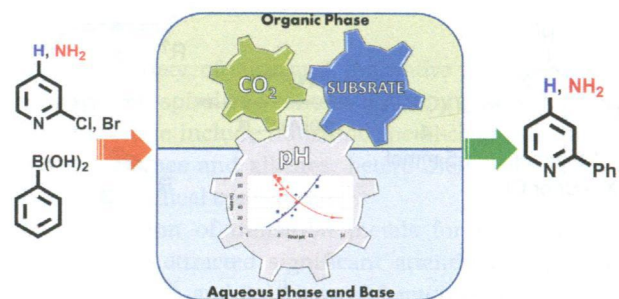


7598

The effects of CO₂ pressure and pH on the Suzuki coupling of basic nitrogen containing substrates

C. Senter, A. Rumble, W. Medina-Ramos, D. Houle, Z. Cheng, C. Gelbaum, J. Fisk, B. Holden, P. Pollet, C. A. Eckert and Charles L. Liotta*

The Suzuki coupling reaction of basic nitrogen containing substrates (2-bromo- and 2-chloro-4-aminopyridine, and 2-bromo and 2-chloropyridine) with phenylboronic acid using Pd(TPP)₂Cl₂/K₃PO₄ in acetonitrile–water biphasic solvent systems under a CO₂ or a N₂ atmosphere is discussed.

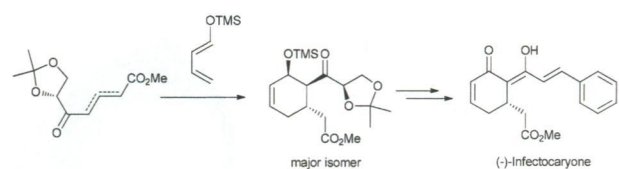


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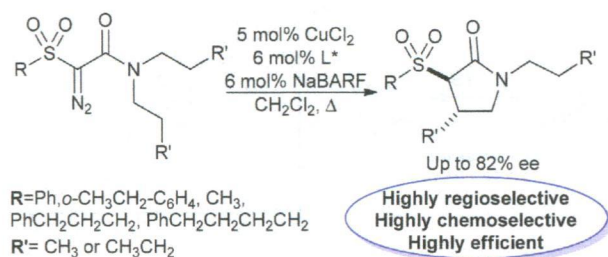
A new approach to asymmetric synthesis of infectocaryone

Xiubing Liu, Lingling Hu, Xiaojing Liu, Junhao Jia, Lizhen Jiang, Jiangfeng Lin and Xiaochuan Chen*

A new approach to the asymmetric synthesis of infectocaryone featuring a regioselective and stereoselective Diels–Alder reaction of an isomeric dienophile mixture is developed.



7612

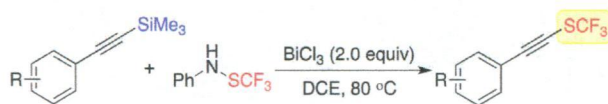


Enantioselective copper catalysed C–H insertion reaction of 2-sulfonyl-2-diazoacetamides to form γ -lactams

Leslie Ann Clarke, Aoife Ring, Alan Ford, Abhijeet S. Sinha, Simon E. Lawrence and Anita R. Maguire*

The first enantioselective copper catalysed intramolecular C–H insertion reactions of 2-sulfonyl-2-diazoacetamides is reported.

7629

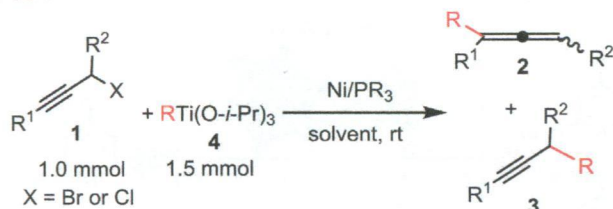


A concise synthesis of (alkynyl)(trifluoromethyl)sulfanes via a bismuth(III)-promoted reaction of trimethyl(alkynyl)silane with trifluoromethanesulfanylamide

Jie Sheng and Jie Wu*

A bismuth(III)-promoted reaction of trimethyl(alkynyl)silanes with trifluoromethanesulfanylamide is developed, giving rise to (alkynyl)(trifluoromethyl)sulfanes in good yields.

7634



Nickel-catalyzed substitution reactions of propargyl halides with organotitanium reagents

Qing-Han Li,* Jung-Wei Liao, Yi-Ling Huang, Rwei-Tang Chiang and Han-Mou Gau*

A simple and mild catalytic coupling reaction of propargyl halides with organotitanium reagents is reported.