



The following Communications have been judged by at least two referees to be “very important papers” and will be published online at www.angewandte.org soon:

T. Lewis, M. Faubel, B. Winter, J. C. Hemminger*

CO₂ Capture in an Aqueous Solution of an Amine: Role of the Solution Interface

Y. H. Kim, S. Banta*

Complete Oxidation of Methanol in an Enzymatic Biofuel Cell by a Self-Assembling Hydrogel Created from Three Modified Dehydrogenases

W. Gan, B. Xu, H.-L. Dai*

Activation of Reactions of Thiols at the Silver-Nanoparticle Surface

H. S. Choi, K. Nasr, S. Alyabyev, D. Feith, J. H. Lee, S. H. Kim, Y. Ashitate, H. Hyun, G. Patonay, L. Strekowski, M. Henary,* J. V. Frangioni*

Zwitterionic Near-Infrared Fluorophores and Their Fate In Vivo

M. Sasaki, Y. Kondo, M. Kawahata, K. Yamaguchi, K. Takeda*

Enantioselective Synthesis of Siloxallenes from Alkynoyl Silanes by Reduction and a Brook Rearrangement and Their Subsequent Trapping in a [4+2] Cycloaddition with Unusual Facial Selectivity

A. Bonet, C. Pubill-Ulldemolins, C. Bo,* H. Gulyás,* E. Fernández*
Transition-Metal-Free Diboration by the Activation of Diboron Compounds with Simple Lewis Bases

M. Evangelisti,* O. Roubeau, E. Palacios, A. Camón, T. N. Hooper, E. K. Brechin, J. J. Alonso

Cryogenic Magnetocaloric Effect in a Ferromagnetic Molecular Dimer

W. Liu, V. Khedkar, B. Baskar, M. Schürmann, K. Kumar*

Branching Cascades: A Concise Synthetic Strategy Targeting Diverse and Complex Molecular Frameworks

M. Nakanishi, D. Katayev, C. Besnard, E. P. Kündig*
Synthesis of Fused Indolines by Palladium-Catalyzed Asymmetric C–C Coupling Involving an Unactivated Methylene Group

A. W. Fay, M. A. Blank, C. C. Lee, Y. Hu,* K. O. Hodgson,* B. Hedman,* M. W. Ribbe*

Spectroscopic Characterization of a Precursor Isolated from NifEN of an Iron–Molybdenum Cofactor



“Guaranteed to make me laugh is a ridiculous accumulation of buzzwords. Science really can be fun at times!”

What I look for first in a publication are the figures ...”

This and more about Hans-Dieter Arndt can be found on page 5994.

Author Profile

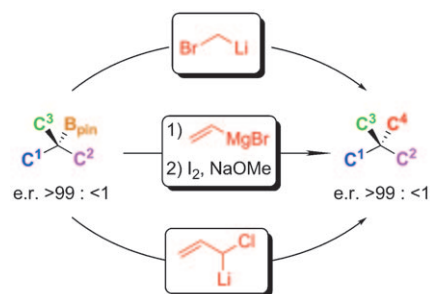
Hans-Dieter Arndt — 5994

Classics in Total Synthesis III

K. C. Nicolaou, Jason S. Chen

Books

reviewed by D. Menche, S. Essig — 5995



Taking another path: Three different methods for the homologation of boronates have been developed by Aggarwal and co-workers in a powerful new approach to the enantioselective construction of quaternary carbon centers (see scheme; B_{pin} = pinacolatoboryl). The starting enantiomerically enriched *tert*-alkyl boronates can be prepared with excellent enantioselectivity.

Highlights

Quaternary Carbon Centers

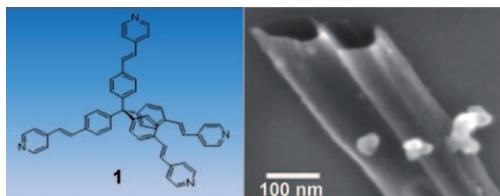
M. Shimizu* — 5998 – 6000

Construction of Asymmetric Quaternary Carbon Centers with High Enantioselectivity

Supramolecular Chemistry

A. Facchetti* ————— 6001 – 6003

Coordination Polymer Nanostructures



All coordinated: Coordination polymers are an intriguing class of materials that combines classical and modern metal-coordination chemistry with the often complex formation of large supramolec-

ular structures (see picture). A recent example is the formation of coordination nanotubes, in which the nature of the azine ligand profoundly defines the structure of the resulting assemblies.

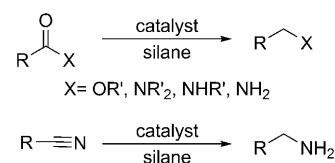
Minireviews

Catalytic Reduction

D. Addis, S. Das, K. Junge,
M. Beller* ————— 6004 – 6011

Selective Reduction of Carboxylic Acid Derivatives by Catalytic Hydrosilylation

Time for a change: Excellent chemoselectivity that is not attainable with traditional organometallic hydrides and hydrogenation catalysts is often observed in the catalytic hydrosilylation of carboxylic acid derivatives (see scheme). Moreover, hydrosilanes are easy-to-use reducing agents that can be activated under mild conditions. Until now, the potential of such reactions, which could be useful in complex organic synthesis, has been underestimated.

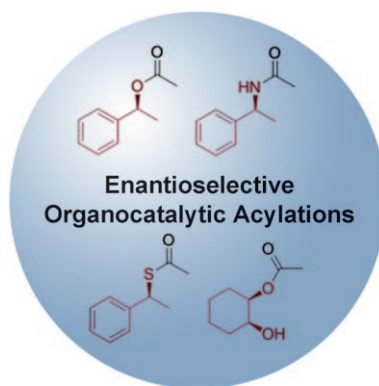


Reviews

Acyl Transfer

C. E. Müller,
P. R. Schreiner* ————— 6012 – 6042

Organocatalytic Enantioselective Acyl Transfer onto Racemic as well as *meso* Alcohols, Amines, and Thiols



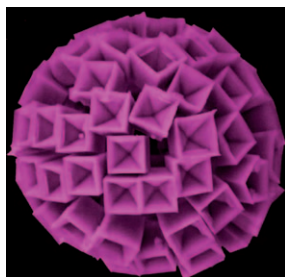
Ode to the perfect pass: Acyl transfer is one of the most vibrant areas of organocatalysis. Such transfer reactions, in part mimicking nature, are steadily turning kinetic resolutions as well as enantioselective transformations into practical tools for the preparation of basic chiral building blocks.

For the USA and Canada:
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individuals who are personal members of a national chemical society prices are available on request. Postage and handling charges included. All prices are subject to local VAT/sales tax.

Communications

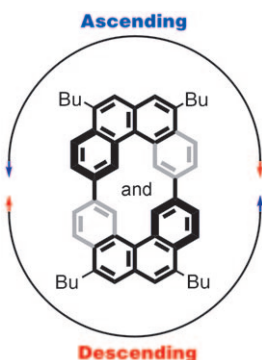


Plain cubes are passé: Hopper-like single crystals of NaCl and KCl are successfully formed at the interface of metastable water microdroplets; these crystals then self-assemble (see picture). The growth mechanism and method for controlling the crystallization of the water-soluble species are proposed.

Crystal Growth

J. Zhang, S. Zhang, Z. Wang, Z. Zhang,*
S. Wang, S. Wang* — 6044 – 6047

Hopper-Like Single Crystals of Sodium Chloride Grown at the Interface of Metastable Water Droplets

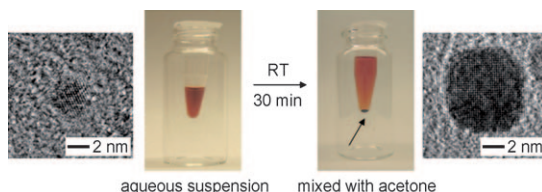


Ascending and Descending: A combination of two helical molecules and two twisting covalent axes in the form of a macrocycle conjures an illusory molecular object that has a seemingly impossible molecular structure, that is, an endlessly descending circle that consists of an sp^2 -carbon network, which can be regarded as the molecular expression of Penrose stairs (see picture).

Penrose Stairs

W. Nakanishi, T. Matsuno, J. Ichikawa,
H. Isobe* — 6048 – 6051

Illusory Molecular Expression of “Penrose Stairs” by an Aromatic Hydrocarbon



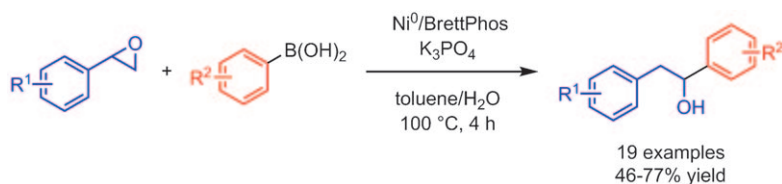
Easy control: Small Pd and Au nanocrystals exhibited a drastic change in size and/or morphology when their aqueous suspensions were mixed with a solvent (e.g., acetone or tetrahydrofuran) less polar

than water. The morphological changes occurred through particle coalescence, which was triggered by the abrupt reduction in colloidal stability upon partial solvent exchange.

Nanoparticles

B. Lim, T. Yu, J. Park, Y. Zheng,
Y. Xia* — 6052 – 6055

Mixing an Aqueous Suspension of Pd or Au Nanocrystals with a Less Polar Solvent Can Cause Changes to Size, Morphology, or Both



Let's get multicatalytic! A Ni^0 catalyst complexed with a biaryldialkyl monophosphine ligand facilitates C–C bond formation between styrenyl epoxides and aryl boronic acids (see scheme). X-ray analysis of a catalytically active nickel/

ligand complex supports a redox pathway involving C_{sp^2} –O bond activation. A variety of α -substituted alcohols were generated with good reaction efficiency by a multicatalytic sequence.

Cross-Coupling

D. K. Nielsen, A. G. Doyle* – 6056 – 6059

Nickel-Catalyzed Cross-Coupling of Styrenyl Epoxides with Boronic Acids



Fullerenes

E. E. Maroto, A. de C3zar, S. Filippone,
 A. Mart3n-Domenech, M. Suarez,
 F. P. Coss3o,* N. Mart3n* — **6060 – 6064**



Hierarchical Selectivity in Fullerenes:
 Site-, Regio-, Diastereo-, and Enantio-
 control of the 1,3-Dipolar Cycloaddition to
 C_{70}



Make your choice of stereochemistry: The first enantioselective cycloaddition of N-metalated azomethine ylides to the C_{70} molecule affords both pyrrolidino[70]fullerene enantiomers, with ee values over 90%, depending on the chiral metal complex used (see picture). The high site- and regioselectivity observed has been accounted for by the nucleophilic and electrophilic Fukui indexes determined by theoretical calculations.

Nanomaterials

S. Sarkar, N. S. Karan,
 N. Pradhan* — **6065 – 6069**



Ultrasmall Color-Tunable Copper-Doped
 Ternary Semiconductor Nanocrystal
 Emitters



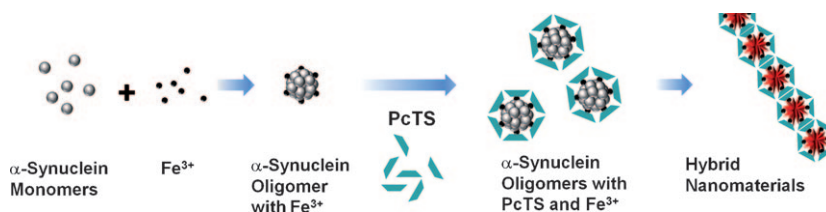
Surface cation exchange of Zn^{II} for In^{III} allows the emission of Cu-doped zinc indium selenide semiconductor nanocrystals to be tuned in the range of 660–540 nm, and thus the emission color to be varied from red to green (see picture; the arrow indicates increasing Zn^{II} content).

Protein Nanofibrils

Y. S. Choi, J. Kim, G. Bhak, D. Lee,
 S. R. Paik* — **6070 – 6074**



Photoelectric Protein Nanofibrils of α -
 Synuclein with Embedded Iron and
 Phthalocyanine Tetrasulfonate



Daylight saving: Hybrid protein nanofibrils were prepared by phthalocyanine tetrasulfonate (PcTS)-mediated assembly of iron-induced α -synuclein oligomers (see picture). The nanofibrils,

which can be tightly packed into a 2D array, show the photoelectric properties of light harvesting and electrical conductivity.

Enzyme Assays

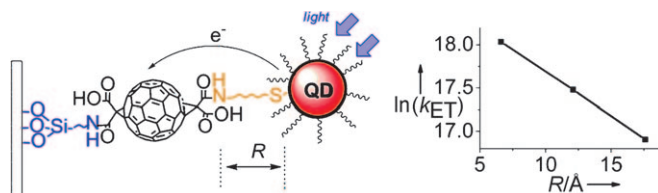
J. M3ller, T. Becher, J. Braunstein,
 P. Berdel, S. Gravius, F. Rohrbach,
 J. Oldenburg, G. Mayer,*
 B. P3tzsch* — **6075 – 6078**



Profiling of Active Thrombin in Human
 Blood by Supramolecular Complexes



To clot or not to clot: The coagulation system is a multienzymatic network associated with bleeding or thrombosis in patients. A supramolecular oligonucleotide-adapted approach (see picture) makes thrombin, the key enzyme of this network, measurable in vivo. In patients undergoing hip-replacement surgery, thrombin was identified as a valuable biomarker to allow monitoring of the activity level of the coagulation system under clinical conditions.



Link and gain: A series of donor-bridge-acceptor systems in the form of core/shell CdSe/ZnS quantum dot-bridge-fullerene heterodimers (see picture) with varying bridge length and varying quantum dot

size were self-assembled by a surface-based stepwise method to demonstrate control of the rate and of the magnitude of fluctuations of photoinduced electron transfer at the single-molecule level.

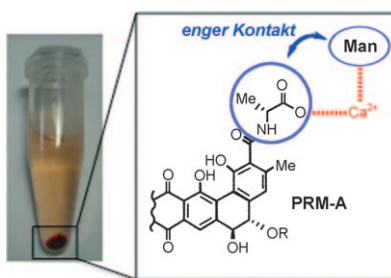
Heterodimers

Z. Xu, M. Cotlet* — 6079 – 6083

Quantum Dot-Bridge-Fullerene Heterodimers with Controlled Photoinduced Electron Transfer



Aggregation facilitates analysis: The Ca²⁺-dependent mannose (Man) binding of the nonpeptidic carbohydrate binder pradimicin A (PRM-A) was investigated in the solid state. The use of PRM-A aggregates eliminated problems associated with the three-component equilibrium. A combination of ¹¹³Cd NMR spectroscopy and 2D dipolar-assisted rotational resonance revealed the mannose-binding site of PRM-A and the crucial role of the Ca²⁺ ion (see binding model).



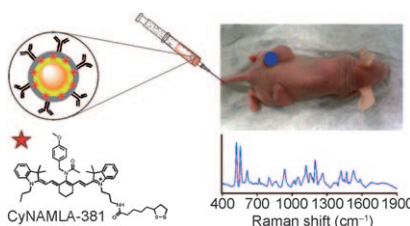
Carbohydrate Binding

Y. Nakagawa,* Y. Masuda, K. Yamada, T. Doi, K. Takegoshi, Y. Igarashi, Y. Ito* — 6084 – 6088

Solid-State NMR Spectroscopic Analysis of the Ca²⁺-Dependent Mannose Binding of Pradimicin A



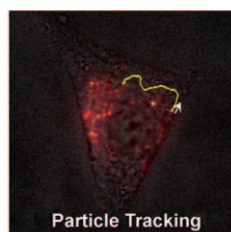
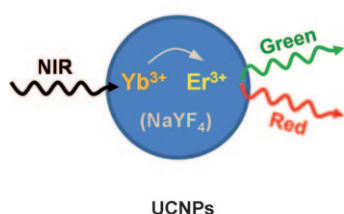
Of good report: Synthesis and screening of an 80-member tricyanocyanine library identified CyNAML-381 as a near-IR surface-enhanced Raman spectroscopy (SERS) reporter with good signal stability and higher sensitivity than the standard. Encapsulation of CyNAML-381 on gold nanoparticles and conjugation to an antibody afforded SERS nanotags with excellent sensitivity, stability, and tumor specificity in xenograft models (see picture).



SERS Reporters

A. Samanta, K. K. Maiti, K. S. Soh, X. Liao, M. Vendrell, U. S. Dinish, S. W. Yun, R. Bhuvaneswari, H. Kim, S. Rautela, J. Chung, M. Olivo, Y. T. Chang* — 6089 – 6092

Ultrasensitive Near-Infrared Raman Reporters for SERS-Based In Vivo Cancer Detection



A track record: Upconverting nanoparticles (UCNPs) were tracked in living HeLa cells and their active transport by motor proteins was visualized in real time. The

remarkable photostability of the UCNPs and the noninvasiveness of near-infrared excitation allowed continuous observation of living cells for as long as 6 h.

Cell Imaging

S. H. Nam, Y. M. Bae, Y. I. Park, J. H. Kim, H. M. Kim, J. S. Choi, K. T. Lee,* T. Hyeon, Y. D. Suh* — 6093 – 6097

Long-Term Real-Time Tracking of Lanthanide Ion Doped Upconverting Nanoparticles in Living Cells

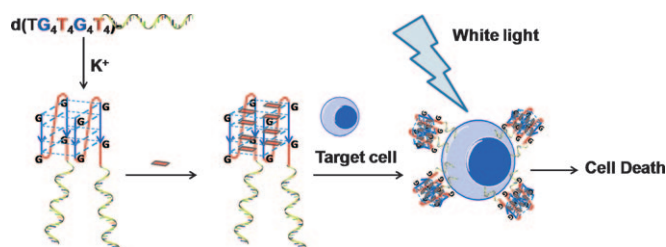


Drug Delivery

K. Wang, M. You, Y. Chen, D. Han, Z. Zhu,
J. Huang, K. Williams, C. J. Yang,*
W. Tan* ————— 6098–6101



Self-Assembly of a Bifunctional DNA
Carrier for Drug Delivery



Speedy delivery: A self-assembled bifunctional unit incorporates a DNA aptamer for target recognition (see picture, green helix) and a G-quadruplex for drug load-

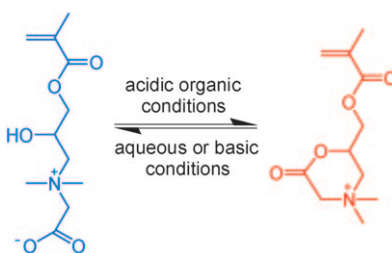
ing. The modified DNA selectively delivered a photosensitizer (red bars) to cancer cells; irradiation with visible light generated high toxicity.

Smart Materials

Z. Cao, N. Brault, H. Xue, A. Keefe,
S. Jiang* ————— 6102–6104



Manipulating Sticky and Non-Sticky
Properties in a Single Material



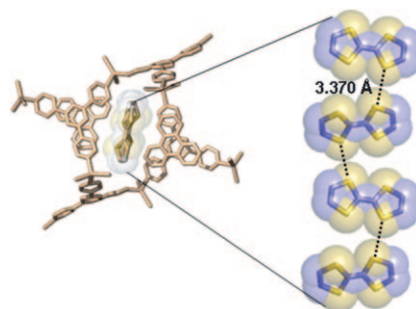
Sticky and non-sticky, together? A newly developed zwitterionic material (CB-OH; blue structure in scheme) has an equilibrium counterpart (CB-Ring; red). This interchangeable material allows control over two distinct properties: “non-sticky” CB-OH (biomolecular resistance) and “sticky” CB-Ring (binding by covalent bonds).

Porous Coordination Networks

J. Martí-Rujas, N. Islam, D. Hashizume,
F. Izumi, M. Fujita, H. J. Song, H. C. Choi,
M. Kawano* ————— 6105–6108



Ab Initio Powder Diffraction Structure
Analysis of a Host–Guest Network: Short
Contacts between Tetrathiafulvalene
Molecules in a Pore



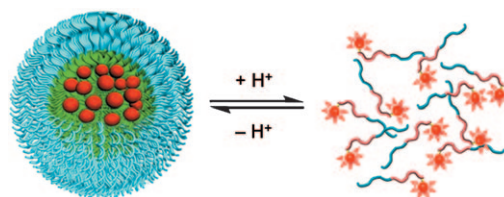
Synchrotron powder XRD analysis was used to solve the crystal structure of a kinetically controlled coordination network including tetrathiafulvalene (TTF) guests, which has a large unit cell (15 729(1) Å³). Very short S...S contacts among the TTF guests were achieved by confinement in the network pores (see picture).

Functional Nanoparticles

K. Zhou, Y. Wang, X. Huang,
K. Luby-Phelps, B. D. Sumer,
J. Gao* ————— 6109–6114

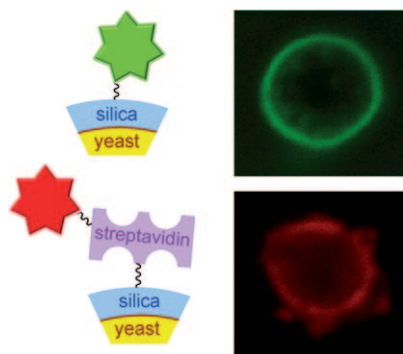


Tunable, Ultrasensitive pH-Responsive
Nanoparticles Targeting Specific
Endocytic Organelles in Living Cells



Switch it up: Tunable, pH-responsive nanoparticles can be selectively activated in different endocytic compartments. At high pH values, micelle formation (see picture, left) quenches fluorescence by Förster resonance energy transfer. The

micelles disassemble at low pH values, leading to fluorescence emission. This nonlinear on/off nanoplatform offers many exciting opportunities in diagnostic imaging and drug-delivery applications.

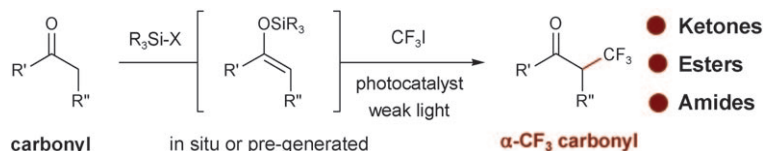


Tough shell: Living yeast cells can be simultaneously silica-encapsulated and thiol-functionalized by polycondensation of silicic acid and (3-mercaptopropyl)trimethoxysilane under mild conditions. Various functions such as fluorescent dyes (see picture; green: fluorescein, red: rhodamine), chemical moieties, or proteins, can be introduced to the artificial shell by using maleimide-based coupling reactions.

Biomimicry

S. H. Yang, E. H. Ko, Y. H. Jung,
I. S. Choi* 6115–6118

Bioinspired Functionalization of Silica-Encapsulated Yeast Cells



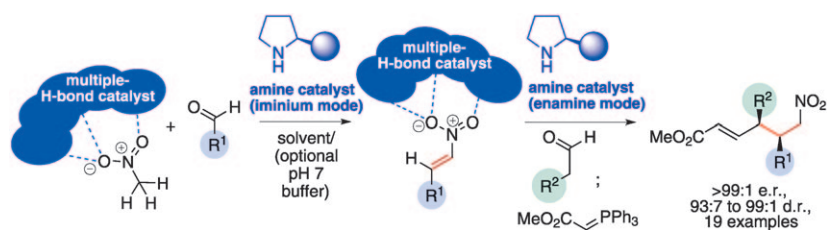
A facile and efficient method for the α -trifluoromethylation of carbonyl compounds and enolsilanes has been accomplished through application of a photoredox catalysis strategy. A one-flask pro-

cedure for the direct α -trifluoromethylation and α -perfluoroalkylation of ketone, amide, and ester substrates as well as silylketene acetals is described (see scheme).

Photoredox Catalysis

P. V. Pham, D. A. Nagib,
D. W. C. MacMillan* 6119–6122

Photoredox Catalysis: A Mild, Operationally Simple Approach to the Synthesis of α -Trifluoromethyl Carbonyl Compounds



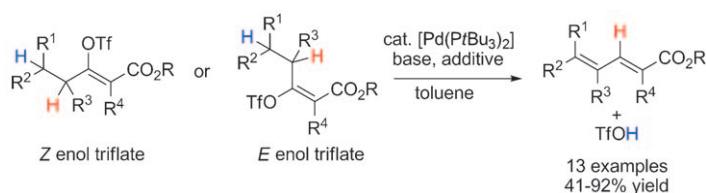
It takes two to tango: A dual catalyst system, composed of a highly enantioselective enamine catalyst and a multiple-hydrogen-bond catalyst, enabled the chemoselective union of two aldehydes and a

nitromethane unit with near-perfect enantioselectivities, excellent diastereoselectivities, and high yields under neutral conditions (see scheme).

Organocatalysis

H. Rahaman, Á. Madarász, I. Pápai,
P. M. Pihko* 6123–6127

Dual Hydrogen-Bond/Enamine Catalysis Enables a Direct Enantioselective Three-Component Domino Reaction



Dying to be Dienes: Substituted 1,3-dienes were synthesized by the title reaction (see scheme; Tf = trifluoromethanesulfonyl). Preliminary studies support a mechanistically distinct pathway that involves an initial β -hydride

elimination from a cationic vinyl palladium(II) intermediate, a subsequent regioselective hydropalladation of the corresponding allene intermediate, and a final β -hydride elimination.

Palladium Catalysis

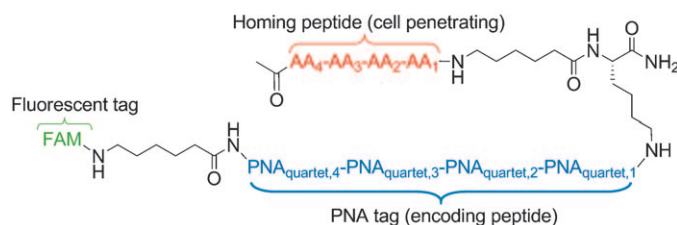
I. T. Crouch, T. Dreier,
D. E. Frantz* 6128–6132

Palladium-Catalyzed Elimination/Isomerization of Enol Triflates into 1,3-Dienes



Homing Peptides

N. Svensen, J. J. Díaz-Mochón,
K. Dhaliwal, S. Planonh, M. Dewar,
J. D. Armstrong,
M. Bradley* ————— **6133–6136**



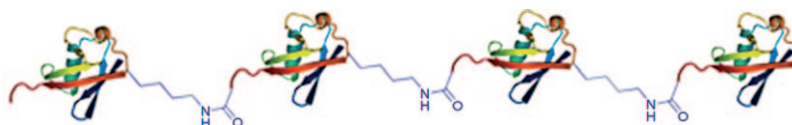
Screening of a Combinatorial Homing Peptide Library for Selective Cellular Delivery

To the point: The identification of peptides to optimize both the delivery and tumor penetration of existing cancer drugs in a cell-selective manner would be highly desirable. The screening of a peptide

nucleic acid (PNA)-encoded peptide library (see picture) now allows the identification of versatile cell homing peptides for any cell type of interest.

Protein Synthesis

K. S. A. Kumar, S. N. Bavikar, L. Spasser,
T. Moyal, S. Ohayon,
A. Brik* ————— **6137–6141**



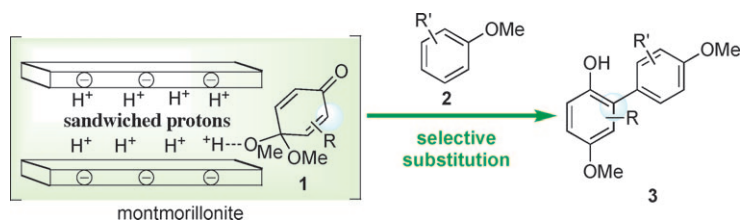
Total Chemical Synthesis of a 304 Amino Acid K48-Linked Tetraubiquitin Protein

A new record: The largest chemically synthesized polypeptide composed of 304 residues, which corresponds to folded K48-tetraubiquitin, has been achieved (see scheme). The presented synthetic

method could be applied to any of the remaining tetraubiquitin chains, and should ultimately assist ongoing efforts to unravel how the remarkable diversity of ubiquitin signaling is achieved.

Biaryls

T. Dohi, N. Washimi, T. Kamitanaka,
K.-I. Fukushima, Y. Kita* — **6142–6146**



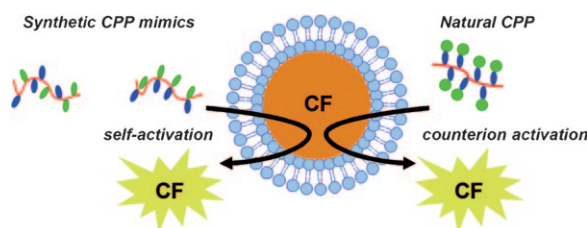
Coupling of Quinone Monoacetals Promoted by Sandwiched Brønsted Acids: Synthesis of Oxygenated Biaryls

Unusual protons: Brønsted acids sandwiched between sheets of solid acids, such as montmorillonites, activated quinone monoacetals **1** to selectively react with aromatic nucleophiles **2** in an

unprecedented substitution reaction. The synthetic utility of the strategy for obtaining highly oxygenated biaryls **3** is highlighted by the synthesis of gilyvocarin aglycones.

Peptide Mimics

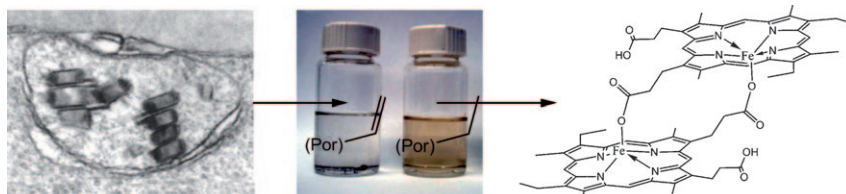
A. Som, A. O. Tezgel, G. J. Gabriel,
G. N. Tew* ————— **6147–6150**



Self-Activation in De Novo Designed Mimics of Cell-Penetrating Peptides

DIY transduction: Cell-penetrating peptides (CPPs) efficiently cross the nonpolar biological membrane, but activation by hydrophobic counterions is essential for transport activity. Polymeric mimics of

CPPs are coupled with hydrophobic side chains; the “self-activation” in these species is demonstrated by transport of the fluorescent probe CF out of bilayer vesicles.



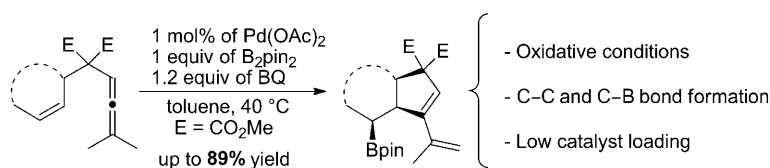
Where the action is: Changing the vinyl groups of hematin anhydride to either ethyl or hydrogen groups results in increased solubility (see picture; Por = porphyrin). Determination of the weak binding constants of the antimalarial drug

chloroquine to dimers of these hematin anhydride analogues suggests that solution-phase heme/drug interactions alone are unlikely to be the origin of the action of the drug.

Drug Interactions

D. S. Bohle,* E. L. Dodd, A. J. Kosar, L. Sharma, P. W. Stephens,* L. Suárez, D. Tazoo ————— **6151–6154**

Soluble Synthetic Analogues of Malaria Pigment: Structure of Mesohematin Anhydride and its Interaction with Chloroquine in Solution



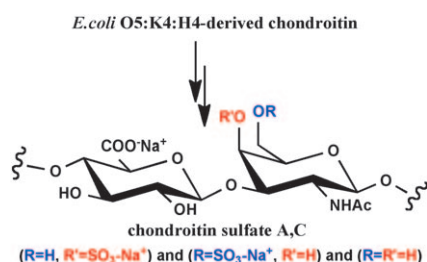
An efficient oxidative carbocyclization/borylation of enallenes uses $\text{Pd}(\text{OAc})_2$ as the catalyst, B_2pin_2 as the boron-transfer reagent, and 1,4-benzoquinone (BQ) as the oxidant (see scheme). The reaction seems to take place through activation of

the allene by a Pd^{II} complex to give an alkenyl- Pd^{II} intermediate followed by carbopalladation of the olefin and subsequent cleavage of the intermediate palladium-carbon bond by the boron reagent.

Synthetic Methods

A. K. Å. Persson, T. Jiang, M. T. Johnson, J.-E. Bäckvall* ————— **6155–6159**

Palladium-Catalyzed Oxidative Borylative Carbocyclization of Enallenes

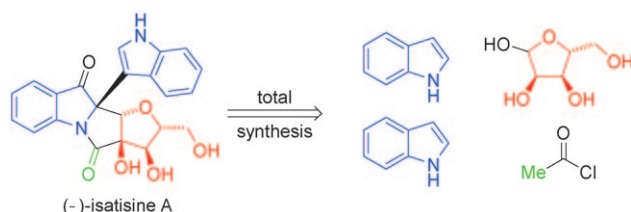


No pigs, no cows needed: Chondroitin sulfate for pharmacological uses is obtained from animal sources in low abundance and with a laborious downstream purification. It has now been synthesized for the first time by an innovative microbiological-chemical approach consisting of chondroitin production from *E. coli* K4 fed-batch fermentation and its subsequent regioselective sulfation in five steps and 61 % overall yield (see scheme).

Bioorganic Chemistry

E. Bedini,* C. De Castro, M. De Rosa, A. Di Nola, A. Iadonisi, O. F. Restaino, C. Schiraldi, M. Parrilli ————— **6160–6163**

A Microbiological-Chemical Strategy to Produce Chondroitin Sulfate A,C



Short and sweet: (–)-Isatisine A was constructed using common and inexpensive building blocks, such as indole and D-ribose (see scheme). The synthesis fea-

tures an unprecedented intramolecular C glycosylation of an indole and an oxidative ring contraction.

Natural Products

X. Zhang, T. Mu, F. Zhan, L. Ma, G. Liang* ————— **6164–6166**

Total Synthesis of (–)-Isatisine A

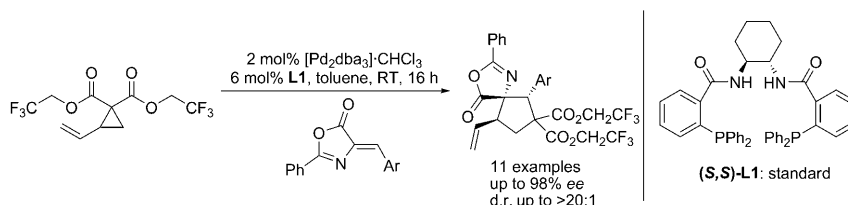


Asymmetric Synthesis

B. M. Trost,* P. J. Morris — 6167–6170



Palladium-Catalyzed Diastereo- and Enantioselective Synthesis of Substituted Cyclopentanes through a Dynamic Kinetic Asymmetric Formal [3+2]-Cycloaddition of Vinyl Cyclopropanes and Alkylidene Azlactones



An enantioselective preparation of vinyl-cyclopentanes has been achieved through the title reaction (see scheme). A range of aryl, heterocyclic, alkenyl, and alkyl sub-

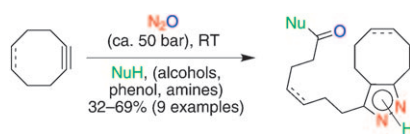
stituted azlactone alkylidenes have been utilized, giving the cyclopentane products in good yield, diastereomeric ratio, and enantioselectivity.

Nitrogen Heterocycles

K. Banert,* O. Plefka — 6171–6174



Synthesis with Perfect Atom Economy: Generation of Diazo Ketones by 1,3-Dipolar Cycloaddition of Nitrous Oxide at Cyclic Alkynes under Mild Conditions



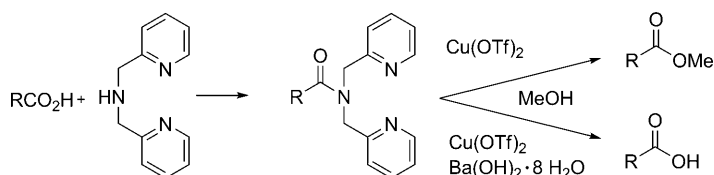
A cascade of five steps, transforms cyclo-octynes in the presence of nucleophiles NuH and nitrous oxide, into the depicted products (see scheme). In another example, nitrous oxide was added at a cyclo-alkyne at -25°C to generate the corresponding diazo ketone. In both cases, all three atoms of nitrous oxide were incorporated into the products.

Protecting Groups

M. C. Bröhmer, S. Mundinger, S. Bräse, W. Bannwarth* — 6175–6177



Chelating Carboxylic Acid Amides as Robust Relay Protecting Groups of Carboxylic Acids and their Cleavage under Mild Conditions



Free choice: Carboxamides of bispicolylamine are alternative protecting groups for carboxylic acids (see scheme). As a consequence of their straightforward applicability, their high chemical stability towards a broad range of conditions, and

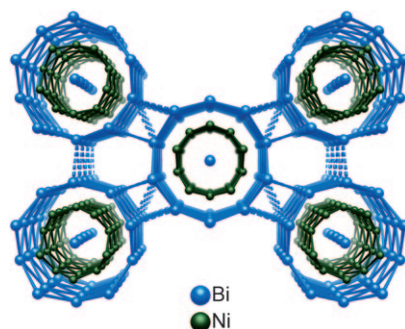
their selective cleavage under mild conditions to give either carboxylic acids or their methyl esters, this new protection method should find widespread application in the realm of organic synthesis.

Metastable Metals

M. Kaiser, A. Isaeva, M. Ruck* — 6178–6180



A Metastable Metal with Decagonal Local Symmetry Obtained by Low-Temperature Pseudomorphosis



Losing an I: The metastable metallic compound $\text{Bi}_{28}\text{Ni}_{25}$ is the product of the mild reduction of the solid precursor $\text{Bi}_{28}\text{Ni}_{25}\text{I}_5$. In a pseudomorphosis the iodine is completely extracted while the macroscopic crystals are preserved. The unique structure is composed of decagonal nanorods, which consist of an outer Bi tube, an inner Ni tube, and additional Bi atoms along the central axis (see structure).



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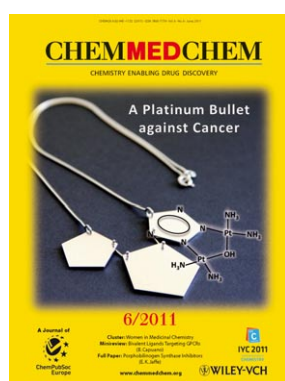
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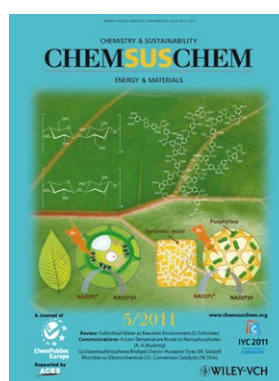
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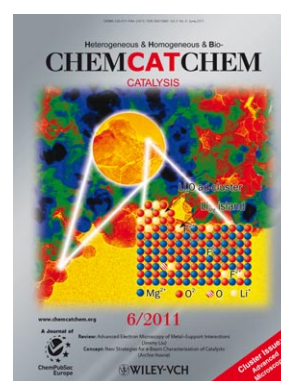
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