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Cover

A snapshot from a molecular dynamics simulation of the mechanical unfolding of barnase; the termini were pulled at a 'constant speed' of 0.01 Åps⁻¹ using a time-dependent harmonic potential on the terminal C^a carbon atoms. This frame was taken 5 ns into the simulation, at which point the protein is already substantially unfolded.

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EATURE ARTICLE

What can atomic force microscopy tell us about protein folding?

Robert B. Best and Jane Clarke

Atomic force spectroscopy has emerged as a new tool for studying protein folding, which complements existing techniques. What can this new technique tell us about the unfolding energy surface and how can it be used to determine detailed unfolding pathways under force?

COMMUNICATIONS



Solid-phase template-directed synthesis of a [2]rotaxane using a solidphase stopper

José A. Bravo, David Orain and Mark Bradley

The first synthesis of a rotaxane by solid phase chemistry has been achieved, using the resin bead as a 'Mega' stopper. One of the advantages of this methodology over traditional solution routes include the ability to use mass action to drive the chemistry, without complicating the purification process.



In vivo cleavage of a target RNA by copper kanamycin A. Direct observation by a fluorescence assay

Chun-An Chen and J. A. Cowan

A novel fluorescence assay to monitor in vivo cleavage chemistry of RNA target sequences has been established and used to demonstrate the activity of copper aminoglycoside mediated degradation of RNA in bacterial cells.



The biosynthesis of bisvertinolone: evidence for oxosorbicillinol as a direct precursor

Naoki Abe, Tadaharu Arakawa and Akira Hirota

Biosynthetic incorporation of labeled sodium acetate into oxosorbicillinol in *Trichoderma* sp. USF-2690 suggests that oxosorbicillinol is derived from six acetate units, and subsequent bioconversion of the labeled oxosorbicillinol to bisvertinolone in the fermentation of the strain suggests that bisvertinolone is biosynthesized from oxosorbicillinol and sorbicillinol in a Michael-type reaction.

$[(C^N^N)Pt(C\equiv C)_n R]$ (HC^N^N = 6-aryl-2,2'-bipyridine, n = 1-4, R = aryl, SiMe₃) as a new class of light-emitting materials and their applications in electrophosphorescent devices

Wei Lu, Bao-Xiu Mi, Michael C. W. Chan, Zheng Hui, Nianyong Zhu, Shuit-Tong Lee and Chi-Ming Che

The σ -alkynyl ligand is the key to tunable, strong photophosphorescence and stability during vacuum deposition for these organometallic materials. Orange to red electrophosphorescence derived from the pictured emitters displays maximum luminance approaching 10000 cd m⁻².







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 Pd catalyze cvclization

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Unprecedented zwitterion in quinonoid chemistry

Olivier Siri and Pierre Braunstein

The first 12π -electron zwitterionic structure in quinonoid chemistry is described with the *N*,*N*,*O*,*O*-molecule shown in which the positive charge is π -delocalized between the nitrogen atoms and the negative charge between the oxygen atoms; depending on the crystallization solvent, a 1D-tape-like H-bonded network can be generated in the solid-state.

Immobilized α -diazophosphonoacetate as a versatile key precursor for palladium catalyzed indole synthesis on a polymer support

Kazuo Yamazaki and Yoshinori Kondo

Rh(II)-catalyzed N–H insertion reaction of immobilized diazophosphonoacetate with 2-haloanilines followed by Horner–Emmons reaction gave immobilized enaminoesters, which were efficiently cyclized to indoles *via* intramolecular palladium catalyzed reaction on a polymer support.

Molecular design and evaluation of quinoxaline-carbohydrate hybrids as novel and efficient photo-induced GG-selective DNA cleaving agents

Kazunobu Toshima, Ryusuke Takano, Tomohiro Ozawa and Shuichi Matsumura

Quinoxaline, found in antitumor quinoxaline antibiotics, was found to cleave double stranded DNA at the 5' side guanine of 5'-GG-3' site on irradiation with long wavelength UV light without any additive; furthermore, a bis(quinoxaline–carbohydrate) hybrid system was very effective for DNA cleavage.

Discriminating between lanthanide ions: self-assembly of heterodimetallic triple-stranded helicates

Nicolas André, Rosario Scopelliti, Gérard Hopfgartner, Claude Piguet and Jean-Claude G. Bünzli

Discrimination between lanthanide ions with ionic radii differing by about 0.1 Å is achieved by means of a heteroditopic ligand which self-assembles with these ions to yield f–f heterodimetallic helicates.

Tandem radical and non-radical reactions mediated with thiols—a new method of cleavage of allylic amines

Michèle P. Bertrand, Stéphanie Escoubet, Stéphane Gastaldi and Vitaliy I. Timokhin



ArS[•] promotes the isomerisation of allylic amines to enamines. Subsequent cleavage occurs *via* a thioaminal intermediate.



1) Horner-Emmons





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Design of 3-D coordination networks: topology and metrics

Sylvie Ferlay, Stéphanie Koenig, Mir Wais Hosseini, Jérome Pansanel, André De Cian and Nathalie Kyritsakas

A doubly interpenetrated pseudo-diamondoid 3-D network was obtained using Ag+ cation and a hetero tetradentate tecton with C_{3v} symmetry bearing three CN and one OH group.

A novel C-C bond formation reaction with 1-methoxymethylindolylborate Minoru Ishikura, Hiromi Kato and Nobuyuki Ohnuki

A novel cascade of intramolecular alkyl-boryl migration in indolylborate was applied for a 'one-pot' construction of tri-substituted indoles.



PhCHO

PdLn

H-OCH

New microporous coordination polymer affording guest-coordination sites at channel walls

Shin-ichiro Noro, Susumu Kitagawa, Masahiro Yamashita and Tatsuo Wada

By utilizing a novel synthetic scenario (two-step self-assembly), a microporous coordination polymer with guest-coordination sites at channel walls was rationally synthesized.

Conjugate addition of radicals generated from diacyloxyiodobenzenes to dehydroamino acid derivatives; a synthesis of diaminopimelic acid analogues

Andrew Sutherland and John C. Vederas



Radical decomposition of bis((2S)-N-benzyloxycarbonyl-2aminopentan-5-carboxy-1-methyl ester)iodobenzene followed by decarboxylation and subsequent conjugate addition with a series of selectively protected dehydroamino acids leads to new analogues of diaminopimelic acid.



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Polyclonal antibody-catalysed hydrolysis of a β-lactam

Elizabeth L. Ostler, Marina Resmini, Guillaume Boucher, Nickolas Romanov, Keith Brocklehurst and Gerard Gallacher

We report the first example of antibody-catalysed hydrolysis of a β -lactam where the antibodies were generated by a simple transition-state analogue; in this example the antibodies are polyclonal.





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Dendritic chiral auxiliaries on silica: a new heterogeneous catalyst for enantioselective addition of diethylzinc to benzaldehyde

Young-Min Chung and Hyun-Ku Rhee

Silica supported dendritic chiral auxiliaries are effective for the enantioselective addition of diethylzinc to benzaldehyde.



K. Krishnamoorthy, A. Q. Contractor and Anil Kumar

Electrochemical homopolymerization of metanillic acid has been achieved for the first time using a 4:1 acetonitrile–water mixture to get 100% sulfonated polyaniline which is soluble in both organic and aqueous solvents, electrically conducting, and is *n*-dopable.

pH-Regulated formation of amyloid-like β -sheet assemblies from polyglutamate grafted polyallylamine

Tomoyuki Koga, Kazuhiro Taguchi, Takatoshi Kinoshita and Masahiro Higuchi

A novel artificial protein with simple primary structure, $poly(\gamma-methyl-L-glutamate)$ -grafted polyallylamine, has been prepared and the resultant peptide has shown a unique property of pH-regulated conformation and morphology.

Catalytic asymmetric synthesis of *O*-acetyl cyanohydrins from KCN, Ac₂O and aldehydes

Yuri N. Belokon, Andrey V. Gutnov, Margarita A. Moskalenko, Lidia V. Yashkina, Denis E. Lesovoy, Nicolai S. Ikonnikov, Vladimir S. Larichev and Michael North

The first asymmetric, catalytic synthesis of cyanohydrin derivatives using potassium cyanide as an inexpensive and non-volatile cyanide source is reported. Reactions are carried out in the presence of acetic anhydride to generate cyanohydrin acetates with up to 93% enantiomeric excess.

Deracemisation and stereoinversion of α -amino acids using D-amino acid oxidase and hydride reducing agents

Timothy M. Beard and Nicholas J. Turner

The deracemisation and stereoinversion of both cyclic and acyclic $DL-\alpha$ -amino acids, using porcine kidney D-amino acid oxidase (DAAO) and a hydride reducing agent (NaCNBH₃–NaBH₄), has been investigated.



ACN/H2O (4:1)

SO₂H

TEAFB, 0°C

Elect. Oxd

so₂⊦









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Diels-Alder chemistry of 2-diethoxyphosphinylcyclohex-2-enones. A new approach to complex phosphonates and synthetic applications of the βketo phosphonate system

PO(OEt) 2. KH ithium Naphthalenide then R²X

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Chiung-Fang Chien, Jen-Dar Wu, Tai Wei Ly, Kak-Shan Shia and Hsing-Jang Liu

A Diels-Alder reaction provides a direct access to some phosphonatecontaining polycyclic compounds. The phosphonate group can also act as a handle for further reductive alkylation or intramolecular Wadsworth-Horner-Emmons process.

A new and short method for the synthesis of 2,4-methanoproline

Thomas Rammeloo and Christian V. Stevens

2,4-Methanoproline, a supposed non-proteinogenic anti-feedant, was synthesised in 5 steps starting from allyl benzyl ether in 10% overall yield with an intramolecular nucleophilic substitution as the key step for the formation of the bicyclic skeleton.

Structure and exchange in silicon-linked tetraradicals

Yi Liao, Martha Baskett, Paul M. Lahti and Fernando Palacio

The EPR spectroscopy, crystallography, and magnetic susceptibility of tetrakis(Noxyl-2,2,6,6-tetramethylpiperidin-4-yl)silane and tetrakis(4-N-tert-butyl-Naminoxylphenyl)silane show that silicon acts as a weak intramolecular exchange linker for polynitroxides, although both tetraradicals show onset of inter-spin exchange at reduced temperatures.

A novel route for synthesis of γ -butyrolactone through the coupling of hydrogenation and dehydrogenation

Yu-Lei Zhu, Hong-Wei Xiang, Gui-Sheng Wu, Liang Bai and Yong-Wang Li

A coupling process of the hydrogenation of maleic anhydride and the dehydrogenation of 1,4-butanediol has been invented for the synthesis of ybutyrolactone over a Cu-Zn catalyst, realizing optimal hydrogen utilization and better energy efficiency.



New layered manganese oxide halides

Christopher S. Knee and Mark T. Weller

The synthesis and structures of two novel manganese based oxide chlorides are reported. These materials belong to a large family of manganese(III/IV) oxide halides and have potential interest with respect to magnetoresistance effects.









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outer monolayer

inner

monolayer

outward

flon

inward

flip

500 nm

500 nm

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1-Allyl-3-propylthiourea modified mesoporous silica for mercury removal Valentyn Antochshuk and Mietek Jaroniec

1-Allyl-3-propylthiourea modified mesoporous silica has high adsorption capacity for mercury ions and its regeneration can be accomplished by washing with 10% thiourea in aqueous 0.05 M HCl.

Selective phosphatidylethanolamine translocation across vesicle membranes using synthetic translocases

J. Middleton Boon, Rameshwer Shukla, Bradley D. Smith, Giulia Licini and Paolo Scrimin

Two sulfonamide derivatives of tris(aminoethyl)amine selectively facilitate the translocation of a fluorescent phospholipid probe containing the phosphoethanolamine head-group across vesicle membranes.

A simple route towards tubular ZnO

Jun Zhang, Lingdong Sun, Chunsheng Liao and Chunhua Yan

A simple route through thermal treatment of $Zn(NH_3)_4^{2+}$ precursor in ethanol is presented to fabricate tubular ZnO, which exhibits strong UV emission and has potential applications.

The acylation of an acyl complex resulting in a labile OCO tridentate ligand

Tiziana Funaioli, Giulia Falchi, Fabio Marchetti and Giuseppe Fachinetti



The reaction of propionic anhydride with $[fac-Ru(C(O)Et)(CO)_2(H_2O)_3][CF_3SO_3]$ produces a new propylidin dipropionato group, which behaves as a tridentate ligand giving the neutral complex $Ru\{CEt(OC(O)Et)_2\}(CO)_2(CF_3SO_3)$.



A modular approach to porphyrin oligomers using metal ions as connectors

S. Richeter, C. Jeandon, R. Ruppert and H. J. Callot



Porphyrins bearing two external coordination sites allowed the stepwise preparation of polymetallic oligomers connected by metal centers.



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Synthesis of bent [4]phenylene (cyclobuta[1,2-*a*:3,4-b']bisbiphenylene) and structure of a bis(trimethylsilyl) derivative: the last [4]phenylene isomer

Dennis T.-Y. Bong, Lionel Gentric, Daniel Holmes, Adam J. Matzger, Frank Scherhag and K. Peter C. Vollhardt

The effect of benzocyclobutadienofusion of linear and angular [3]phenylene, respectively, as manifested in the title compound, results in increased diatropism and reduced reactivity of the central ring of the former (red), but decreased diatropism and increased reactivity of that of the latter (blue).

Stereoselective intramolecular hydrogen abstraction by a chiral benzophenone derivative

Miguel A. Miranda, Luis A. Martínez, Abdelouahid Samadi, Francisco Boscá and Isabel M. Morera

Using specifically designed bichromophores containing both a chiral benzophenone and a chiral hydrogen source it is shown here that photochemical hydrogen abstraction can be a stereoselective process.

The effect of $\Delta\Lambda$ chirality on molecular organization in two-dimensional films of a Ru(II) complex with a mesogenic ligand

Kentaro Okamoto, Yuki Matsuoka, Noboru Wakabayashi, Akihiko Yamagishi and Naomi Hoshino

An amphiphilic, 6-coordinate, and Δ , Λ -isomeric Ru(II) complex has been synthesized with a mesogenic ligand. A remarkable difference has been noticed for the monolayer state between a racemic mixture and the Δ -isomer.



A rod-like polymer containing {Ru(terpy)₂} units prepared by electrochemical coupling of pendant thienyl moieties

Johan Hjelm, Edwin C. Constable, Egbert Figgemeier, Anders Hagfeldt, Robyn Handel, Catherine E. Housecroft, Emad Mukhtar and Emma Schofield

Electropolymerisation of a ruthenium complex bearing a pendant thienyl functionality leads to films or a high nuclearity ruthenapolymer



Selective anion effects in chiral complexes of iridium *via* diffusion and HOESY data: relevance to catalysis

Daniela Drago, Paul S. Pregosin and Andreas Pfaltz

PGSE diffusion measurements help to define how anions interact with cations in catalytically relevant Ir-complexes. A combined PGSE/HOESY approach is recommended.



R₁ = CH₃; R₂ = R₁ = H; R₂ = C

 Δ -[Ru(acac)₂L]



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