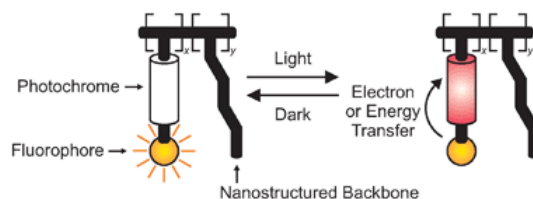


- Fluorescence modulation with photochromic switches in nanostructured constructs
Yildiz, I.; Deniz, E.; Raymo, F. M. *Chem. Soc. Rev.* **2009**, *38*, 1859 – 1867.

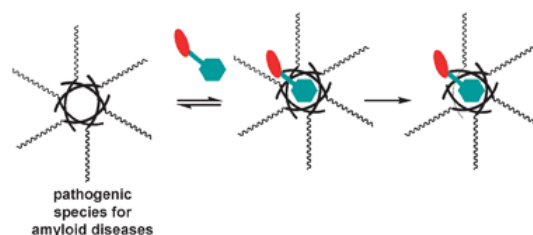
Abstract:



This *tutorial review* illustrates the structural design, photochemical and photophysical properties of nanostructured constructs incorporating luminescent and photochromic components. In these systems, the pronounced structural and electronic modifications that accompany the transformations of the photochromic components can be exploited to modulate the emission intensity of the luminescent components on the basis of electron and energy transfer processes. These photoresponsive systems can be assembled by: (1) integrating fluorescent and photochromic components within the main chain of the same polymer; (2) attaching multiple photochromes to a fluorescent organic polymer or luminescent inorganic nanoparticle; (3) appending either independent fluorophores and photochromes or fluorophore–photochrome dyads to a common polymer scaffold; (4) trapping distinct fluorophores and photochromes within the hydrophobic interior of the same cross-linked polymer. In all instances, the changes in absorbance and/or redox potentials associated with the reversible interconversion of the two states of each photochromic component regulate the radiative deactivation of the luminescent components. As a result, the emission intensity of these nanoscaled assemblies can reversibly be switched between high and low values under the influence of optical stimulations. Thus, these clever operating principles for fluorescence modulation can lead to the development of innovative functional and nanostructured materials with photoresponsive character. In particular, protocols for the optical writing and reading of data as well as luminescent probes for bioimaging applications might ultimately emerge from these fundamental studies on photoresponsive molecular switches.

- Target-selective peptide-cleaving catalysts as a new paradigm in drug design
Lee, T. Y.; Suh, J. *Chem. Soc. Rev.* **2009**, *38*, 1949 – 1957.

Abstract:

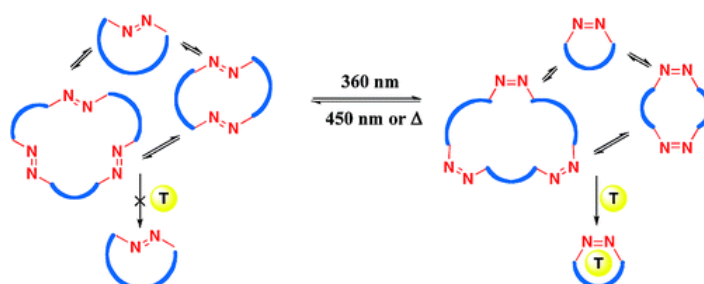


This *tutorial review* describes the evolution of peptide-hydrolyzing metal catalysts towards artificial metalloproteases cleaving target proteins selectively. The catalytic cleavage of the backbone of a protein related to a disease may effect a cure. In particular, a new therapeutic option for amyloid diseases such as Alzheimer's disease, diabetes and Parkinson's disease has been presented. The new paradigm of drug design based on artificial metalloproteases should be of interest to researchers in the areas of biomimetic chemistry, as well as medicinal chemistry.

- Photoswitchable Dynamic Combinatorial Libraries: Coupling Azobenzene Photoisomerization with Hydrazone Exchange

Ingerman, L. A.; Waters, M. L. *J. Org. Chem.* **2009**, *74*, 111–117.

Abstract:

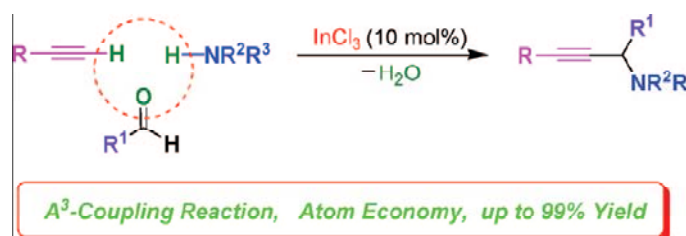


The novel azobenzene-based monomer **1** was prepd., equipped with the necessary functionality to undergo simultaneous dynamic exchange processes: hydrazone exchange and photoisomerization. Acid-promoted hydrolysis of the azobenzene building block produced a dynamic combinatorial library of cyclic oligomers, while multibuilding block libraries were also generated upon addn. of proline-based monomers. Libraries equilibrated under thermal conditions were dominated by trans isomers of the azobenzene macrocycles, whereas light-induced isomerization resulted in a conformational change of the library members to their corresponding cis-azo form. In the presence of a pentaproline template, a slower rate of thermal relaxation of the cis-azobenzene species **1c** was obsd., resulting in stabilization and amplification of this receptor due to favorable binding interactions. The facile identification and application of such photoswitchable receptors have the potential to allow for greater control over mol. recognition events.

- Indium-Catalyzed Highly Efficient Three-Component Coupling of Aldehyde, Alkyne, and Amine via C-H Bond Activation

Zhang, Y.; Li, P.; Wang, M.; and Wang, L. *J. Org. Chem.* **2009**, *74*, 4364–4367

Abstract:

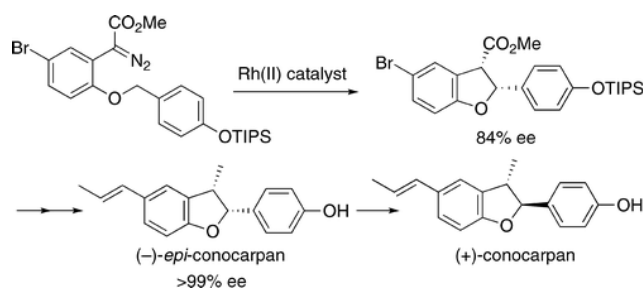


In this paper, indium(III) chloride was found to be a highly effective catalyst for the three-component coupling reactions of aldehydes, alkynes, and amines (A³-coupling) via C-H activation. The reactions could be applied to both aromatic and aliphatic aldehydes and alkynes. Nearly quantitative yields of the desired products were obtained in most cases. No cocatalyst or activator is required, and water is the only byproduct in the reactions. Furthermore, a tentative mechanism of the InCl₃-catalyzed one-pot, three-component coupling of aldehyde, alkyne, and amine is proposed.

- Asymmetric Synthesis of Neolignans (-)-*epi*-Conocarpan and (+)-Conocarpan via Rh(II)-Catalyzed C-H Insertion Process and Revision of the Absolute Configuration of (-)-*epi*-Conocarpan

Natori, Y.; Tsutsui, H.; Sato, N.; Nakamura, S.; Nambu, H.; Shiro, M.; and Hashimoto, S. *J. Org. Chem.* **2009**, *74*, 4418–4421.

Abstract:

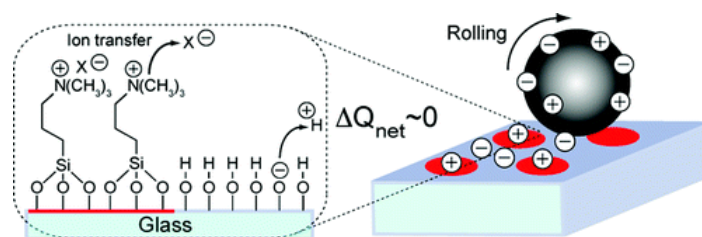


Catalytic asymmetric synthesis of neolignan natural products (-)-*epi*-conocarpan and (+)-conocarpan has been achieved by exploiting an enantio- and diastereoselective intramolecular C-H insertion reaction to construct a *cis*-2-aryl-2,3-dihydrobenzofuran ring system as a key step. The C-H insertion reaction of 5-bromoaryldiazoacetate catalyzed by Rh₂(S-PTTEA)₄, a new dirhodium(II) carboxylate complex that incorporates *N*-phthaloyl-(*S*)-triethylalaninate as chiral bridging ligands, provided 2-aryl-5-bromo-3-methoxycarbonyl-2,3-dihydrobenzofuran with exceptionally high diastereoselectivity (*cis/trans*) 97:3 and high enantioselectivity for the *cis* isomer (84% ee).

- Controlling the Kinetics of Contact Electrification with Patterned Surfaces

Thomas III, S. W.; Vella, S. J.; Dickey, M. D.; Kaufman, G. K.; Whitesides, G. M. *J. Am. Chem. Soc.* **2009**, *131*, 8746–8747.

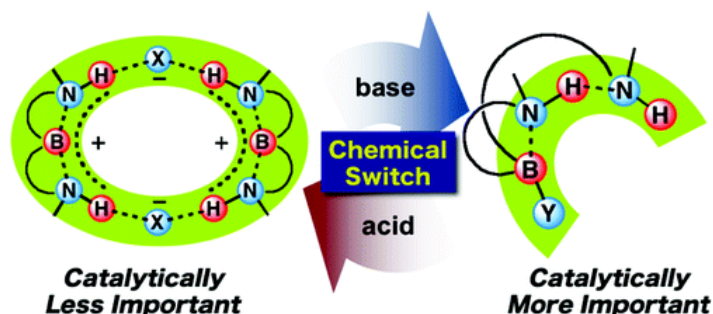
Abstract:



This communication describes a new approach for controlling static charging (contact electrification), and resulting electrical discharging, that occurs when two contacting materials separate. The prevention of contact electrification is an important problem; unwanted adhesion between oppositely charged materials, spark-initiated explosions, and damage to microelectronic circuitry are some of the deleterious effects of static charging. Current strategies for controlling contact electrification rely upon dissipating an accumulated charge by making contacting surfaces conductive and, therefore, can be difficult to implement with electrically insulating materials. Specifically, using our understanding of the ion-transfer mechanism of contact electrification, we patterned glass slides with negatively charging areas (clean glass) and positively charging areas (glass silanized with a cationic siloxane terminated with a quaternary ammonium group). The rate of charge separation due to a steel sphere rolling on the patterned glass surface correlated linearly with the percentage of the glass surface that was silanized; the rate of charge transfer was minimal when 50% of the glass surface area was silanized. Patterned surfaces also prevented electrical discharges between electrically conducting (bare steel) or insulating (acrylate-coated steel) spheres rolling on the glass, because the rate of charging was sufficiently slow to prevent electric fields greater than the dielectric strength of air to develop. This strategy for preventing static charging therefore does not require one of the two contacting surfaces to be electrically conductive. More generally, these results show that our enhanced understanding of the ion-transfer mechanism of contact electrification enables the rational design of chemically tailored surfaces for functional electrets.

- Importance of Open Structure of Nonmetal Based Catalyst in Hydrogen Bond Promoted Methanolysis of Activated Amide: Structure Dynamics between Monomer and Dimer Enabling Recombinant Covalent, Dative, and Hydrogen Bonds
Oishi, S.; Yoshimoto, J.; Saito, S. *J. Am. Chem. Soc.* **2009**, *131*, 8748–8749.

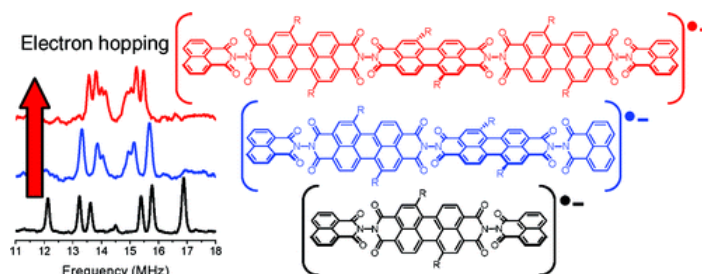
Abstract:



We disclosed structural dynamics hidden behind a series of aminoorganoboron (AOB) compounds that involved a recombinant of covalent, dative, and hydrogen bonds. A combination process occurred via reorganizing elements and bonds between the two major structures (open and closed), which were chemically switchable through precise adjustment of either acidic or basic conditions. The structural dynamics favoring an open structure seem to be more important for catalysis, as represented by methanolysis of activated amides.

- Toward an n-Type Molecular Wire: Electron Hopping within Linearly Linked Perylenediimide Oligomers
Wilson, T. M.; Tauber, M. J.; Wasielewski, M. R. *J. Am. Chem. Soc.* **2009**, *131*, 8952–8957.

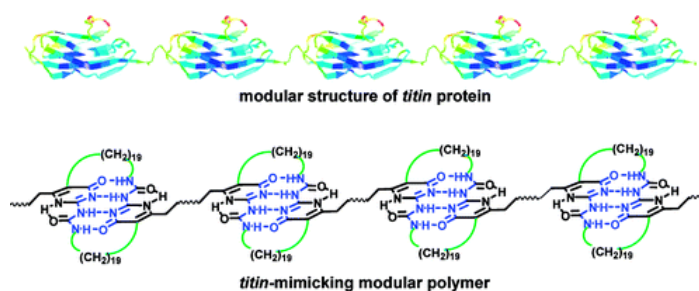
Abstract :



A series of linearly linked perylenediimide (PDI) dimers and trimers were synthesized in which the PDI π systems are nearly orthogonal. These oligomers and several model compounds were singly reduced, and intramolecular electron hopping between the PDI molecules was probed by electron paramagnetic resonance (EPR) and electron nuclear double resonance (ENDOR) spectroscopy. When the functional groups attached to the ends of the oligomers were chosen to make each PDI molecule electronically equivalent, the single electron hops between the PDI molecules with rates that significantly exceed 10^7 s^{-1} . Rapid electron hopping between pairs of PDI molecules having orthogonal π systems is unexpected and may expand the possible design motifs for organic electronic materials based on PDI.

- A Biomimetic Modular Polymer with Tough and Adaptive Properties
M. Kushner, A.; Vossler, D. J.; Williams, A. J.; Guan, Z. *J. Am. Chem. Soc.* **2009**, *131*, 8766–8768.

Abstract:

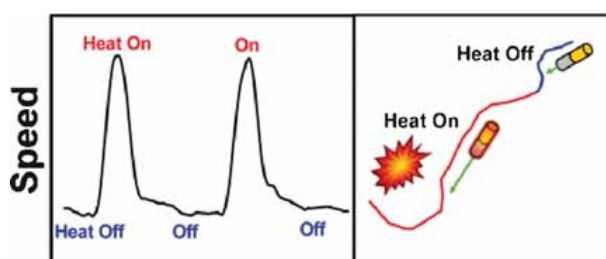


Natural materials employ many elegant strategies to achieve mechanical properties required for survival under varying environmental conditions. Thus these remarkable biopolymers and nanocomposites often not only have a combination of mechanical properties such as high modulus, toughness, and elasticity, but also exhibit adaptive and stimuli-responsive properties. Inspired by skeletal muscle protein titin, we have synthesized a biomimetic modular polymer that not only closely mimics the modular multidomain structure of titin, but also manifests an exciting combination of mechanical properties, as well as adaptive properties such as self-healing and temperature-responsive shape-memory properties.

- Thermal Modulation of Nanomotor Movement

Balasubramanian, S.; Kagan, D.; Manesh, K. M.; Calvo-Marzal, P.; Flechsig, G.-U.; Wang, J. *Small* **2009**, 5, 1569-1574.

Abstract:

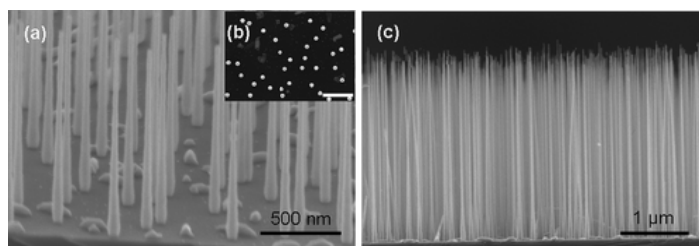


Motion control is essential for various applications of man-made nanomachines. The ability to control and regulate the movement of catalytic nanowire motors is illustrated by applying short heat pulses that allow the motors to be accelerated or slowed down. The accelerated motion observed during the heat pulses is attributed primarily to the thermal activation of the redox reactions of the H₂O₂ fuel at the Pt and Au segments and to the decreased viscosity of the aqueous medium at elevated temperatures. The thermally modulated motion during repetitive temperature on/off cycles is highly reversible and fast, with speeds of 14 and 45 $\mu\text{m s}^{-1}$ at 25 and 65 °C, respectively. A wide range of speeds can be generated by tailoring the temperature to yield a linear speed-temperature dependence. Through the use of nickel-containing nanomotors, the ability to combine the thermally regulated motion of catalytic nanomotors with magnetic guidance is also demonstrated. Such on-demand control of the movement of nanowire motors holds great promise for complex operations of future manmade nanomachines and for creating more sophisticated nanomotors.

- Self-Catalyzed Epitaxial Growth of Vertical Indium Phosphide Nanowires on Silicon

Gao, L.; Woo, R. L.; Liang, B.; Pozuelo, M.; Prikhodko, S.; Jackson, M.; Goel, N.; Hudait, M. K.; Huffaker, D. L.; Goorsky, M. S.; Kodambaka, S.; Hicks, R. F. *Nano Lett.* **2009**, 9, 2223–2228.

Abstract:

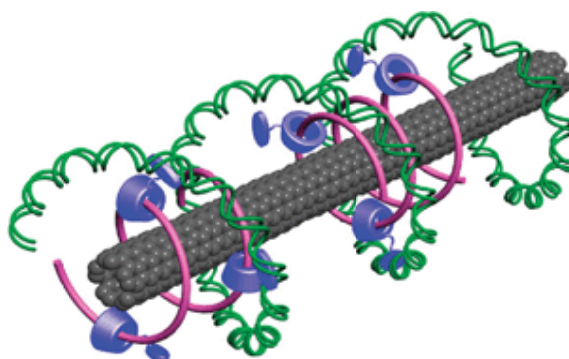


Vertical indium phosphide nanowires have been grown epitaxially on silicon (111) by metalorganic vapor-phase epitaxy. Liquid indium droplets were formed in situ and used to catalyze deposition. For growth at 350 °C, about 70% of the wires were vertical, while the remaining ones were distributed in the 3 other <111> directions. The vertical fraction, growth rate, and tapering of the wires increased with temperature and V/III ratio. At 370 °C and V/III equal to 200, 100% of the wires were vertical with a density of $\sim 1.0 \times 10^9 \text{ cm}^{-2}$ and average dimensions of 3.9 μm in length, 45 nm in base width, and 15 nm in tip width. X-ray diffraction and transmission electron microscopy revealed that the wires were single-crystal zinc blende, although they contained a high density of rotational twins perpendicular to the <111> growth direction. The room temperature photoluminescence spectrum exhibited one peak centered at $912 \pm 10 \text{ nm}$ with a FWHM of $\sim 60 \text{ nm}$.

- Construction, DNA wrapping and cleavage of a carbon nanotube–polypseudorotaxane conjugate.

Chen, Y.; Yu, L.; Feng, X. H.; Hou, S.; Liu, Y. *Chem. Commun.* **2009**, 4106 – 4108.

Abstract:

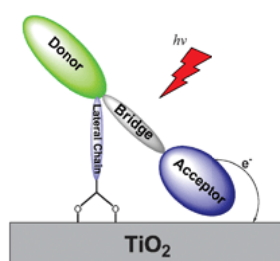


A supramolecular assembly of carbon nanotubes was constructed by non-covalently wrapping cyclodextrin-based polypseudorotaxanes on single wall carbon nanotubes; the assembly showed good abilities in wrapping and cleaving double-stranded DNA.

- Efficient near infrared D—A sensitizers with lateral anchoring group for dye-sensitized solar cells.

Hao, Y.; Yang, X.; Cong, J.; Tian, H.; Hagfeldt, A.; Sun, L. *Chem. Commun.* **2009**, 4031 – 4033.

Abstract:

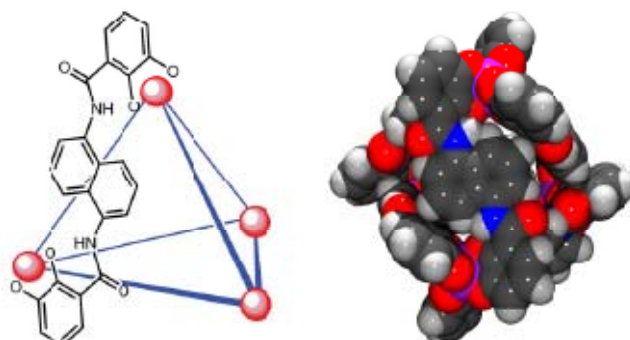


A new strategy in which the anchoring group is separated from the acceptor groups of the dyes was developed; among these dyes, the HY103 dye gives a maximum IPCE value of 86% at 660 nm and an value of 3.7% in the NIR region reported in DSCs.

- Encapsulation and characterization of proton-bound amine homodimers in a water-soluble, self-assembled supramolecular host

Pluth, M. D.; Fiedler, D.; Mugridge, J. S.; Bergman, R. G.; Raymond, K. N. *Proc. Nat. Acad. Sci.* **2009**, *106*, 10438–10443.

Abstract:

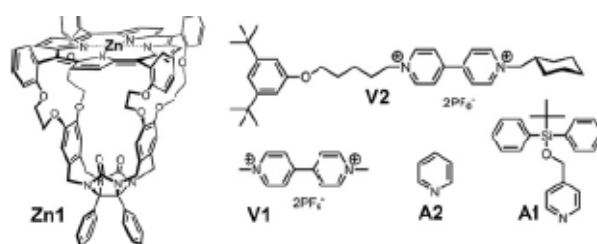


Cyclic amines can be encapsulated in a water-soluble selfassembled supramolecular host upon protonation. The hydrogenbonding ability of the cyclic amines, as well as the reduced degrees of rotational freedom, allows for the formation of proton-bound homodimers inside of the assembly that are otherwise not observable in aqueous solution. The generality of homodimer formation was explored with small *N*-alkyl aziridines, azetidines, pyrrolidines, and piperidines. Proton-bound homodimer formation is observed for *N*-alkylaziridines (*R* = methyl, isopropyl, tert-butyl), *N*-alkylazetidines (*R* = isopropyl, tert-butyl), and *N*-methylpyrrolidine. At high concentration, formation of a proton-bound homotrimer is observed in the case of *N*-methylaziridine. The homodimers stay intact inside the assembly over a large concentration range, thereby suggesting cooperative encapsulation. Both G3(MP2)B3 and G3B3 calculations of the proton-bound homodimers were used to investigate the enthalpy of the hydrogen bond in the protonbound homodimers and suggest that the enthalpic gain upon formation of the proton-bound homodimers may drive guest encapsulation.

- Squaring cooperative binding circles

Deutman, A. B. C.; Monnereau, C.; Moalin, M.; Coumans, R. G. E.; Veling, N.; Coenen, M.; Smits, J. M. M.; de Gelder, R.; Elemans, J. A. A. W.; Ercolani, G.; Nolte, R. J. M.; Rowan, A. E. *Proc. Nat. Acad. Sci.* **2009**, *106*, 10471–10476.

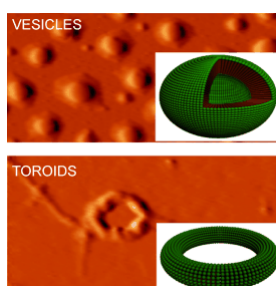
Abstract:



The cooperative binding effects of viologens and pyridines to a synthetic bivalent porphyrin receptor are used as a model system to study how the magnitudes of these effects relate to the experimentally obtained values. The full thermodynamic and kinetic circles concerning both activation and inhibition of the cage of the receptor for the binding of viologens were measured and evaluated. The results strongly emphasize the apparent character of measured binding and rate constants, in which the fractional saturation of receptors with other guests is linearly expressed in these constants. The presented method can be used as a simple tool to better analyze and comprehend the experimentally observed kinetics and thermodynamics of natural and artificial cooperative systems.

- Modulated Morphology in the Self-Organization of a Rectangular Amphiphile
García, F.; Fernández, G.; Sánchez, L. *Chem. Eur. J.* **2009**, *15*, 6740-6747.

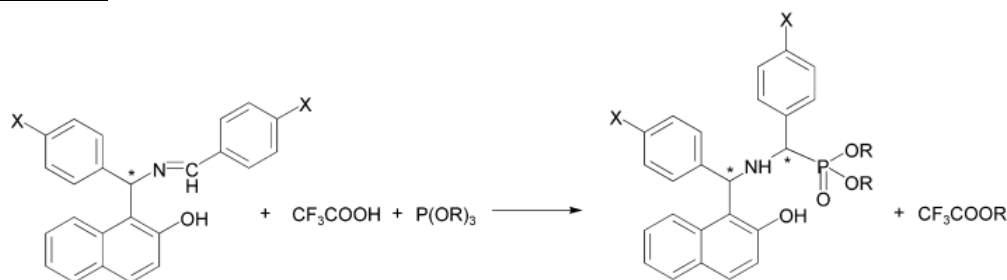
Abstract:



Molecular construction: Concentration and/or solvent polarity changes modify the subtle balance of the attractive non-covalent forces involved in the self-assembly of a rectangular amphiphile. These changes allow the construction of supramolecular architectures ranging from hollow vesicles of different sizes to toroids and wire-like micelles (see figure).

The rectangular oligo(phenylene ethynylene) amphiphile **1** has been synthesized to investigate its self-assembling features in solution and onto surfaces. Concentration-dependent and variable-temperature NMR experiments firstly demonstrate the influence of the solvent in the stabilization of the non-covalent forces involved in the association of **1**, namely, π - π stacking interactions between the aromatic fragments and van der Waals, hydrogen-bonding and/or solvophobic forces between the triethyleneglycol chains. This subtle balance of non-covalent interactions also conditions the thermodynamics of the self-assembly process and concentration-dependent UV/Vis investigations show a linear correlation between the polarity of the solvent and the K_a values ($K_a \approx 5.2 \times 10^5 \text{ M}^{-1}$ for $\text{CH}_3\text{CN}/\text{H}_2\text{O}$ mixtures and $4.4 \times 10^4 \text{ M}^{-1}$ for benzene). Moreover, these UV/Vis studies prove the organization of this compound following the indefinite self-association model. Microscopy techniques reveal that the morphology and dimensionality of the assemblies formed from **1** can be finely modulated. Although polar solvents yield hollow vesicles or toroidal 3D objects, depending upon concentration, the utilization of non-polar benzene results in the formation of unimolecular wires that can grow to form networks upon increasing concentration. These findings support the direct relationship existing between the self-assembling features of this amphiphile in solution and onto surfaces.

- 1-(α -Aminobenzyl)-2-naphthol: A New Chiral Auxiliary for the Synthesis of Enantiopure α -Aminophosphonic Acids
Metlushka, K. E.; Kashemirov, B. A.; Zheltukhin, V. F.; Sadkova, D. N.; Büchner, B.; Hess, C.; Kataeva, O. N.; McKenna, C. E.; Alfonsov, V. E. *Chem. Eur. J.* **2009**, *15*, 6718-6722.

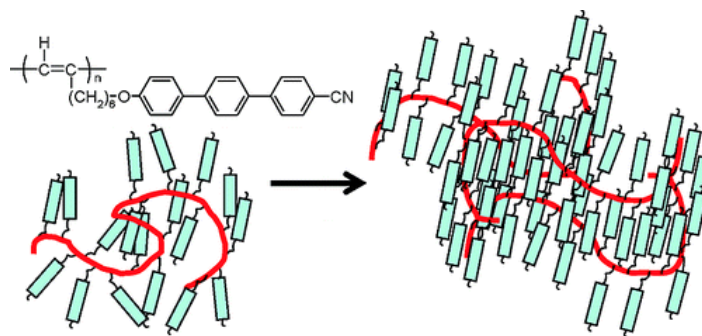
Abstract:

Ooh Betti! A new diastereoselective synthesis of α -aminophosphonates has been developed based on the reaction of trialkyl phosphites with chiral imines derived from (*R*)- or (*S*)-1-(α -aminobenzyl)-2-naphthol (Betti base; see scheme, X=H, CH₃, or Br). The reaction proceeds with high diastereoselectivity. Treatment with HCl results in the formation of the desired α -aminophosphonic acids.

A new diastereoselective synthesis of α -aminophosphonates has been developed, based on the reaction, in the presence of trifluoroacetic acid, of trialkyl phosphites with chiral imines derived from (*R*)- or (*S*)-1-(α -aminobenzyl)-2-naphthol. The reaction proceeds at room temperature in toluene with high diastereoselectivity. The major diastereomer can be separated by crystallization from an appropriate solvent. The relative configuration of both chiral centers of the major diastereomer was determined by single-crystal X-ray structure analysis. The desired α -aminophosphonic acids can be obtained in enantiopure form by treatment of the corresponding diastereomers with HCl.

- Synthesis and Properties of Polyacetylenes Containing Terphenyl Pendant Group with Different Spacers.

Zhou, D.; Chen, Y.; Chen, L.; Zhou, W.; He, X. *Macromolecules* **2009**, *42*, 1454-1461.

Abstract:

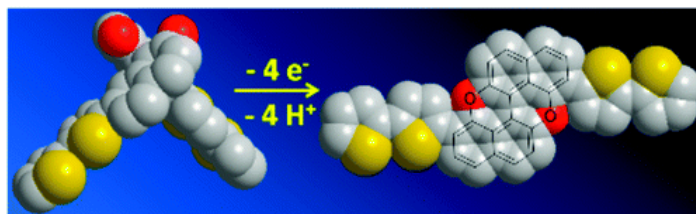
Liquid-crystalline, monosubstituted acetylenes containing terphenyl pendant group with varying spacer lengths [HC≡C(CH₂)_nO-terphenyl-CN, **AnCN**, *n* = 1, 6] and its polymers **PAnCN** were synthesized. Also, the effects of the structural variation on their properties, especially their mesomorphism, UV and photoluminescence behaviors, were studied. The monomers are prepared by simple Suzuki coupling reactions. High yields and high trans-content of polyacetylenes were obtained by polymerization using [Rh(nbd)Cl]₂ catalyst. The polymer with long spacers (hexamethylene), that is, **PA6CN**, formed a nematic mesophase when heated and cooled, however the polymer with short spacers (methylene), that is, **PA1CN**, could not exhibit liquid crystallinity at elevated temperatures. Upon photoexcitation by keep the constant photons of excitation, **PA1CN** emits ultraviolet emission ($\lambda_{\text{max}} \sim 311$ nm) but **PA6CN** gives a stronger emission ($\lambda_{\text{max}} \sim 308$ nm), indicating that the emission intensity increases with the spacer length due to orientation of main chain by alignment of mesogenic pendant. Short spacer between polyacetylene and mesogens

hindered alignment of the main chain, consequently lower fluorescence emission, and loss mesophase of the polymer was induced by short spacer due to disturbance of rigid main chain.

- Conducting Polymers Containing *peri*-Xanthenoxanthenes via Oxidative Cyclization of Binaphthols

Song, C.; Swager, T. M. *Macromolecules* **2009**, *42*, 1472-1475.

Abstract:

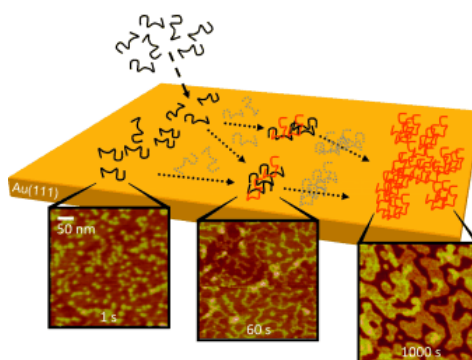


We report an electrochemical transformation of binaphthols to give *peri*-xanthenoxanthene (PXX) groups in small molecules and within polymer backbones. The monomer 7,7'-bis(2,2'-bithiophen-5-yl)-1,1'-bi-2,2'-naphthol (**2**) was subjected to electropolymerization, resulting in the segmented conducting polymer that is stable at low potentials. However, high-potential electrochemical oxidation promoted cyclization of binaphthol units gives PXX, which transforms the moderately conducting segmented polymer into a highly conducting fully conjugated polymer. This oxidative cyclization is a highly effective means by which to incorporate a planar polycyclic heteroaromatic structure (i.e., PXX) into thiophene-based conducting polymers. A model compound study conclusively proved the proposed oxidative cyclization scheme.

- Adsorption, Diffusion, and Self-Assembly of an Engineered Gold-Binding Peptide on Au(111) Investigated by Atomic Force Microscopy

So, C. R.; Tamerler, C.; Sarikaya, M. *Angew. Chem. Int. Ed.* **2009**, *48*, 5174–5177.

Abstract:

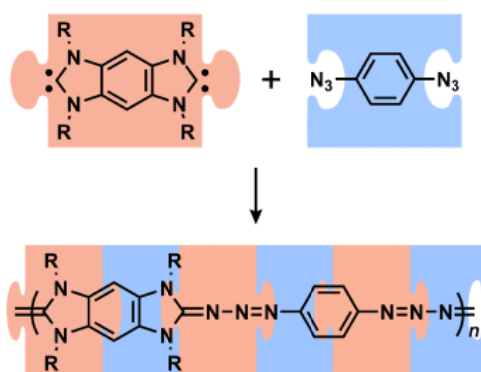


Go for the gold! The structural evolution of peptide binding and assembly on a Au(111) surface is dynamic and involves surface diffusion and multiple stages of molecular thin-film topology development (see schematic depiction and corresponding AFM images). The new fundamental observations may form the basis of peptide-based novel hybrid molecular technologies of the future.

- Adapting N-Heterocyclic Carbene/Azide Coupling Chemistry for Polymer Synthesis: Enabling Access to Aromatic Polytriazenes

Coady, D. J.; Khramov, D. M.; Norris, B. C.; Tennyson, A. G.; Bielawski, C. W. *Angew. Chem. Int. Ed.* **2009**, *48*, 5187–5190.

Abstract:

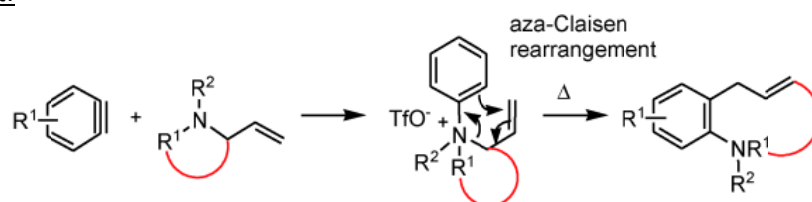


A click by any other name: Coupling bis(N-heterocyclic carbene)s with bis(azide)s afforded a novel class of conjugated polytriazenes. These polymers were rendered electrically conductive upon doping, and fluorene-containing variants exhibited luminescence. This adaptation of N-heterocyclic carbene (NHC)/azide coupling chemistry to polymer synthesis reveals the potential of NHCs as building blocks for accessing polymers having useful electronic properties.

- The Benzyne Aza-Claisen Reaction

Cant, A. A.; Bertrand, G. H. V.; Henderson, J. L.; Roberts, L.; Greaney, M. F. *Angew. Chem. Int. Ed.* **2009**, *48*, 5199–5202.

Abstract:



Adding an aryne to a tertiary allylamine affords *o*-allylaniline products of an aza-Claisen rearrangement. The aryne simultaneously provides the π component for the rearrangement and the quaternization event that lowers the activation energy for the sigmatropic shift. The reaction was applied to the synthesis of medium-ring benzannulated amines (see scheme).

- Click Chemistry beyond Metal-Catalyzed Cycloaddition

Becer, C. R.; Hoogenboom, R.; Schubert, U. S. *Angew. Chem. Int. Ed.* **2009**, *48*, 4900–4908.

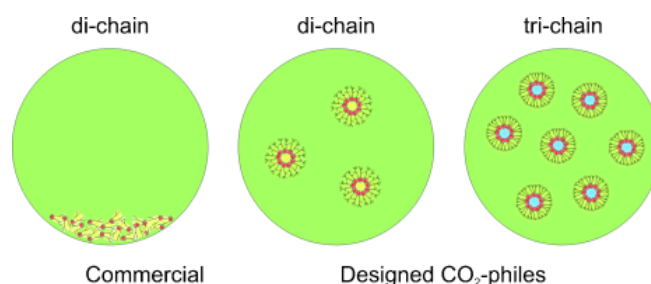
Abstract:



No copper needed: In recent years, a large number of metal-free click reactions have been reported based on thiol-ene radical additions, Diels-Alder reactions, and Michael additions. In this Minireview, special attention is given to the advantages and limitations of the different methods to evaluate whether they have the potential to surpass the overwhelming success of the copper(I)-catalyzed azide-alkyne cycloaddition.

- Tri-Chain Hydrocarbon Surfactants as Designed Micellar Modifiers for Supercritical CO₂
Hollamby, M. J.; Trickett, K.; Mohamed, A.; Cummings, S.; Tabor, R. F.; Myakonkaya, O.; Gold, S.; Rogers, S.; Heenan, R. K.; Eastoe, J. *Angew. Chem. Int. Ed.* **2009**, *48*, 4993–4995.

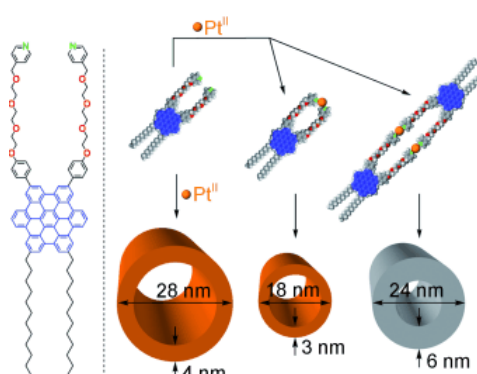
Abstract:



Getting their feet wet: Low-cost hydrocarbon surfactants act as fluid modifiers for supercritical carbon dioxide (scCO₂). Increased terminal branching of the surfactant chains aids micelle formation (see middle picture: CO₂ green), and more chains allows water to be incorporated (right, blue).

- Metal-Ion-Coated Graphitic Nanotubes: Controlled Self-Assembly of a Pyridyl-Appended Gemini-Shaped Hexabenzocoronene Amphiphile
Zhang, W.; Jin, W.; Fukushima, T.; Ishii, N.; Aida, T. *Angew. Chem. Int. Ed.* **2009**, *48*, 4747–4750.

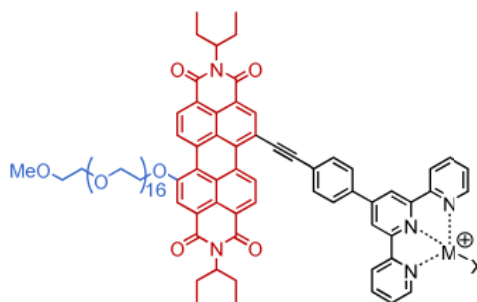
Abstract:



The assembly line: Hexabenzocoronene amphiphiles appended with pyridyl-terminated triethylene glycol side chains, in combination with *trans*-[Pt(PhCN)₂Cl₂], lead to the formation of graphitic nanotubes. The structural features and dimensions of the nanotubes depend on the assembly conditions. A platinum(II)-bridged cyclic dimer having two HBC units self-assembles into a nanotubular structure.

- Coordination-Driven Self-Assembly of PEO-Functionalized Perylene Bisimides: Supramolecular Diversity from a Limited Set of Molecular Building Blocks
Gebers, J.; Rolland, D.; Frauenrath, H. *Angew. Chem. Int. Ed.* **2009**, *48*, 4480–4483.

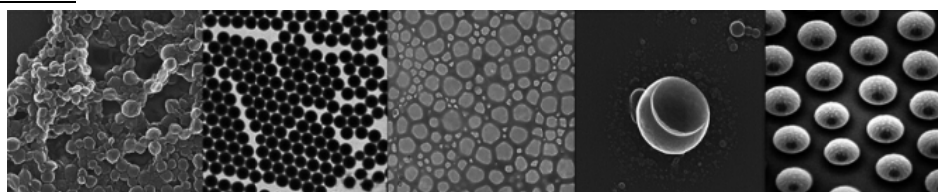
Abstract:



A limited number of poly(ethylene oxide)-substituted perylene bisimides, some of which are equipped with terpyridine ligands for transition-metal coordination (see structure), combine different types of noncovalent interactions to yield optoelectronically active organic materials with different types of supramolecular morphologies.

- Miniemulsion Polymerization and the Structure of Polymer and Hybrid Nanoparticles
Landfester, K. *Angew. Chem. Int. Ed.* **2009**, *48*, 4488 – 4507.

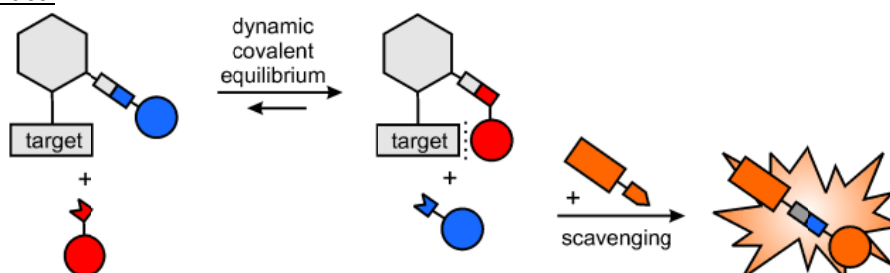
Abstract:



The miniemulsion process allows the formation of complex polymer nanoparticles and the encapsulation of widely varying materials into a polymer shell (see examples). Functionalization of the nanoparticles can be easily carried out, and polymerization to form polymer nanoparticles can be performed in environmentally friendly solvents, such as water.

- Indirect Optical Analysis of a Dynamic Chemical System
Gasparini, G.; Bettin, F.; Scrimin, P.; Prins, L. J. *Angew. Chem. Int. Ed.* **2009**, *48*, 4546 –4550.

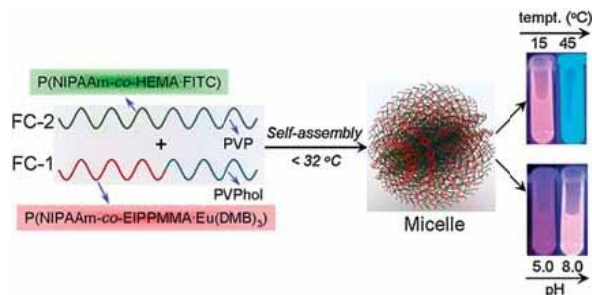
Abstract:



Hide and seek: The composition of a dynamic covalent equilibrium reaction is determined by measuring the ‘left-over’ concentration of a reference compound (blue object, see picture). Reaction of the reference compound with a scavenger generates a characteristic UV/Vis signal that is independent of the molecular structure of the target.

- Temperature- and pH-Sensitive Multicolored Micellar Complexes
Li, Y.-Y.; Cheng, H.; Zhu, J.-L.; Yuan, L.; Dai, Y.; Cheng, S.-X.; Zhang, X.-Z.; Zhuo, R.-X. *Adv. Mater.* **2009**, *21*, 2402-2406.

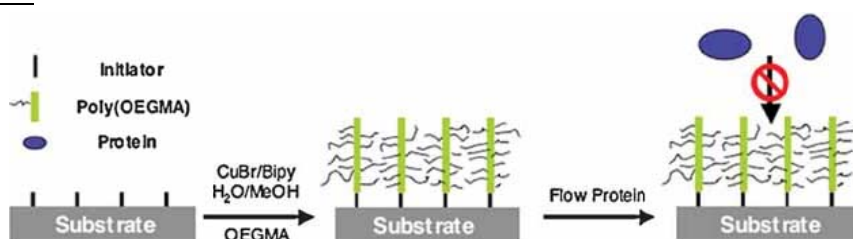
Abstract :



Novel multicolored micellar complexes self-assembled from P(NIPAAm-co-EIPPMMA · Eu(DMB)₃)-b-PVPhol and P(NIPAAm-co-HEMA · FITC)-b-PVP polymers are prepared. These complexes exhibit temperature- and pH-dependent fluorescence, suggesting promising applications for in vivo sensing of the pH and temperature in complicated microenvironments.

- In Pursuit of Zero: Polymer Brushes that Resist the Adsorption of Proteins
Hucknall, A.; Rangarajan, S.; Chilkoti, A. *Adv. Mater.* **2009**, *21*, 2441-2446.

Abstract:



The development of protein-resistant, “non-fouling”, surfaces, followed by recent research on surface-initiated polymerization to fabricate non-fouling polymer brushes on a surface are presented. We demonstrate how the reduction in background noise afforded by protein-resistant polymer brushes yields protein microarrays with a high signal-to-noise ratio in complex fluids, and consequently provides a limit-of-detection for protein analytes in the low femtomolar range.