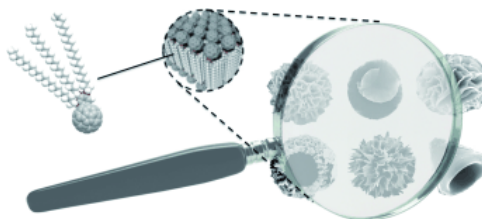


- Fullerene Derivatives That Bear Aliphatic Chains as Unusual Surfactants: Hierarchical Self-Organization, Diverse Morphologies, and Functions

Asanuma, H.; Li, H.; Nakanishi, T.; Möhwald, H. *Chem. Eur. J.* **2010**, *16*, 9330–9338.

Abstract:

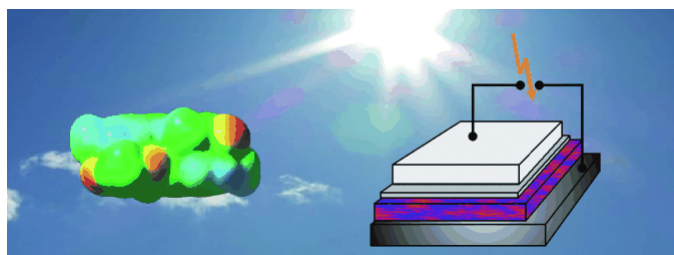


Conventionally, amphiphiles are composed of hydrophobic and hydrophilic units. They are able to exhibit a wide variety of structures depending on the environment. Such features have been applied in supramolecular chemistry, by which apolar and polar groups are implemented in the molecular design. Here we present an attractive approach to introduce unique amphiphilicity. Relatively simple fullerene (C_{60}) derivatives that bear long aliphatic chains behave as uncommon surfactants in organic media. Although two hydrophobic units are used to assemble the derivatives, slight differences in their polarity and chemical nature may make them incompatible and thus arrange them in microphase-separated mesostructures as lamellar ones. These assemblies are maintained by relatively weak forces, π - π interactions among C_{60} moieties and van der Waals forces between alkyl chains. Therefore, the derivatives can undergo “supramolecular polymorphism” by which different supramolecular assemblies arise by changing the conditions of assembly. A simple modification in their substituent motif of derivatives influences the intermolecular interactions and provides a wide variety of supramolecular materials.

- Systems Chemistry Approach in Organic Photovoltaics

Würthner, F.; Meerholz, K. *Chem. Eur. J.* **2010**, *16*, 9366–9373.

Abstract:

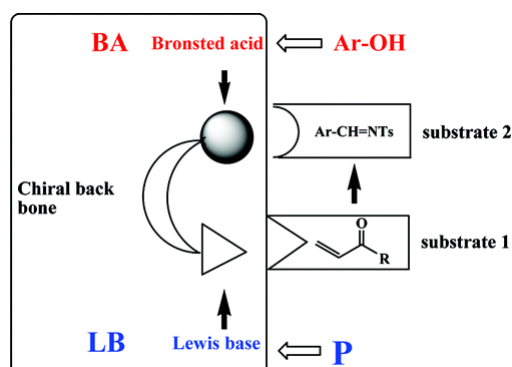


The common approach in organic materials science is dominated by the perception that the properties of the bulk materials are virtually determined by the properties of the molecular building blocks. In this Concept Article, we advocate for taking into account supramolecular organization principles for all kinds of organic solid-state materials, irrespective of them being crystalline, liquid crystalline, or amorphous, and discuss a showcase example, that is, the utilization of merocyanine dyes as p-type organic semiconductors in bulk heterojunction (BHJ) solar cells. Despite their extraordinarily large dipole moments, which are considered to be detrimental for efficient charge carrier transport, BHJ organic photovoltaic materials of these dyes with fullerenes have reached remarkable power conversion efficiencies of meanwhile nearly 5%. These at the first glance contradictory properties are, however, well-understandable on the systems chemistry level.

- Multifunctional Chiral Phosphine Organocatalysts in Catalytic Asymmetric Morita–Baylis–Hillman and Related Reactions

Wei, Y.; Shi, M. *Acc. Chem. Res.* **2010**, *43*, 1005–1018.

Abstract:



Catalytic asymmetric synthesis has received considerable attention over the past few decades, becoming a highly dynamic area of chemical research with significant contributions to the field of organic synthesis. In the development of new catalysts, the concept of multifunctional catalysis described by Shibasaki and co-workers, namely, the combination of more than one functional group within a single molecule to activate the transformation, has proved a powerful strategy in the design of efficient transition metal-containing catalysts.

A variety of reactions have since been addressed with multifunctional organocatalysts. One example is the Morita–Baylis–Hillman (MBH) reaction, in which a carbon–carbon bond is created between the α -position of an activated double-bond compound and a carbon electrophile. The seminal report on this reaction in 1972 described the prototypical couplings of (i) ethyl acrylate with acetaldehyde and (ii) acrylonitrile with acetaldehyde; the reaction is promoted by the conjugate addition of a nucleophilic catalyst to the α,β -unsaturated aldehyde. Many variations of the MBH reaction have been reported, such as the aza-MBH reaction, in which an N-tosyl imine stands in for acetaldehyde. Recent innovations include the development of chiral molecules that catalyze the production of asymmetric products. In this Account, we describe the refinement of catalysts for the MBH and related reactions, highlighting a series of multifunctional chiral phosphines that we have developed and synthesized over the past decade. We also review similar catalysts developed by other groups.

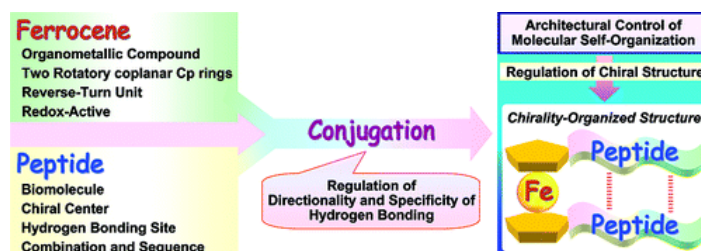
These multifunctional chiral phosphines, which contain Lewis basic and Brønsted acidic sites within one molecule, provide good-to-excellent reactivities and stereoselectivities in the asymmetric aza-MBH reaction, the MBH reaction, and other related reactions. We demonstrate that the reactivities and enantioselectivities of these multifunctional chiral phosphines can be adjusted by enhancing the reactive center's nucleophilicity, which can be finely tuned by varying nearby hydrogen-bonding donors.

Artificial catalysts now provide highly economic access to many desirable compounds, but the general adaptability and reactivity of these platforms remain problematic, particularly in comparison to nature's catalysts, enzymes. The multifunctional organocatalysts described in this Account represent another positive step in the synthetic chemist's efforts to profitably mimic nature's catalytic platform, helping develop small-molecule catalysts with enzyme-like reactivities and selectivities.

- Design of Ferrocene-Dipeptide Bioorganometallic Conjugates To Induce Chirality-Organized Structures

Moriuchi, T.; Hirao, T. *Acc. Chem. Res.* **2010**, *43*, 1040–1051.

Abstract:



The highly ordered molecular assemblies in proteins can have a variety of functions, as observed in enzymes, receptors, and the like. Synthetic scientists are constructing bioinspired systems by harnessing the self-assembling properties of short peptides. Secondary structures such as α -helices, β -sheets, and β -turns are important in protein folding, which is mostly directed and stabilized by hydrogen bonding and the hydrophobic interactions of side chains. The design of secondary structure mimics that are composed of short peptides has attracted much attention, both for gaining fundamental insight into the factors affecting protein folding and for developing pharmacologically useful compounds, artificial receptors, asymmetric catalysts, and new materials.

Ferrocenes are an organometallic scaffold with a central reverse-turn unit based on the inter-ring spacing of about 3.3 Å, which is a suitable distance for hydrogen bonding between attached peptide strands. The conjugation of organometallic compounds with biomolecules such as amino acids, peptides, and DNA should provide novel systems that reflect properties of both the ferrocene and the biologically derived moieties. In this Account, we focus on recent advances in the design of ferrocene–peptide bioconjugates, which help illustrate the peptidomimetic basis for protein folding and the means of constructing highly ordered molecular assemblies.

Ferrocene–peptide bioconjugates are constructed to form chirality-organized structures in both solid and solution states. The ferrocene serves as a reliable organometallic scaffold for the construction of protein secondary structures via intramolecular hydrogen bonding: the attached dipeptide strands are constrained within the appropriate dimensions. The introduction of the chiral dipeptide chains into the ferrocene scaffold induces the conformational enantiomerization of the ferrocenyl moiety; the chirality-organized structure results from intramolecular hydrogen bonding. The configuration and sequence of the amino acids are instrumental in the process.

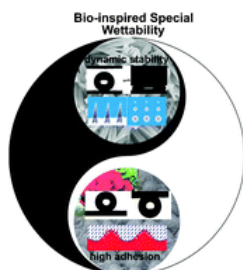
Regulation of the directionality and specificity of hydrogen bonding is a key component in the design of various molecular assemblies. Ferrocene–peptide bioconjugates also have a strong tendency to self-assemble through the contributions of available hydrogen-bonding donors in the solid state. Some ferrocene–peptide bioconjugates bearing only one dipeptide chain exhibit a helically ordered molecular assembly through a network of intermolecular (rather than intramolecular) hydrogen bonds. The propensity to form the chiral helicity appears to be controlled by the chirality of the dipeptide chains.

Organization of host molecules is a useful strategy for forming artificial receptors. The conformationally regulated ferrocene–peptide bioconjugate provides the chirality-organized binding site for size-selective and chiral recognition of dicarboxylic acids through multipoint hydrogen bonds. Metal ions serve a variety of purposes in proteins, including structural stabilization for biological function. The complexation of ferrocene–peptide bioconjugates with palladium(II) compounds not only stabilizes the chirality conformational regulation but also induces conformational regulation of the dipeptide chain through complexation and intramolecular chirality organization. Construction of the chirality-organized ferrocene–peptide bioconjugates is also achieved by metal-directed assembly.

These varied examples amply demonstrate the value of ferrocene–peptide bioconjugates in asserting architectural control over highly ordered molecular assemblies.

- Recent developments in bio-inspired special wettability
Liu, K.; Yao, X.; Jiang, L. *Chem. Soc. Rev.* **2010**, *39*, 3240-3255.

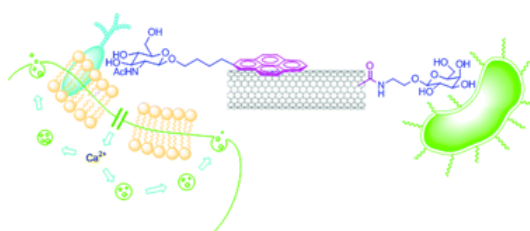
Abstract:



Nature is a school for scientists and engineers. After four and a half billion years of stringent evolution, some creatures in nature exhibit fascinating surface wettability. Biomimetics, mimicking nature for engineering solutions, provides a model for the development of functional surfaces with special wettability. Recently, bio-inspired special wetting surfaces have attracted wide scientific attention for both fundamental research and practical applications, which has become an increasingly hot research topic. This *Critical Review* summarizes the recent work in bio-inspired special wettability, with a focus on lotus leaf inspired self-cleaning surfaces, plants and insects inspired anisotropic superhydrophobic surfaces, mosquito eyes inspired superhydrophobic antifogging coatings, insects inspired superhydrophobic antireflection coatings, rose petals and gecko feet inspired high adhesive superhydrophobic surfaces, bio-inspired water collecting surfaces, and superlyophobic surfaces, with particular focus on the last two years. The research prospects and directions of this rapidly developing field are also briefly addressed (159 references).

- Carbohydrate functionalized carbon nanotubes and their applications
Gorityala, B. K.; Ma, J.; Wang, X.; Chen, P.; Liu, X.-W. *Chem. Soc. Rev.* **2010**, *39*, 2925-2934.

Abstract:



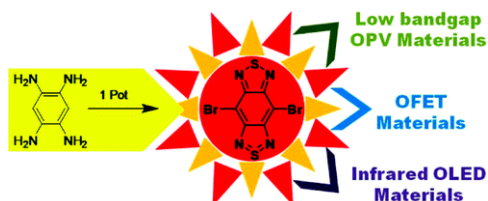
Carbon nanotubes (CNTs) have attracted tremendous attention in biomedical applications due to their molecular size and unique properties. This *tutorial review* summarizes the strategies to functionalize CNTs with bioactive carbohydrates, which improve their solubility, biocompatibility and biofunctionalities while preserving their desired properties. In addition, studies on the usage of carbohydrate functionalized CNTs to detect bacteria, to bind to specific lectins, to deliver glycomimetic drug molecules into cells and to probe cellular activities as biosensors are reviewed. Improvement in biocompatibility and introduction of bio-functionalities by integration of carbohydrate with CNTs are paving the way to glyconanotechnology and may provide new tools for glycobiological studies.

- One-Pot Synthesis of 4,8-Dibromobenzo[1,2-*c*;4,5-*c'*]bis[1,2,5]thiadiazole

Tam, T. L.; Li, H.; Wei, F.; Tan, K. J.; Kloc, C.; Lam, Y. M.; Mhaisalkar, S. G.; Grimsdale, A. C. *Org. Lett.* **2010**, *12*, 3340–3343.

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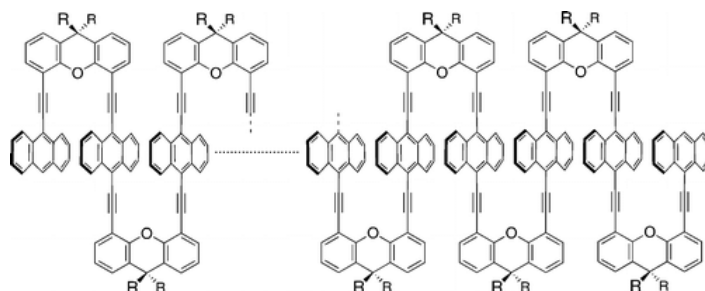
Abstract:



A one-step synthesis of 4,8-dibromobenzo[1,2-c;4,5-c']bis[1,2,5]thiadiazole with use of 1,2,4,5-tetraaminobenzene tetrahydrobromide and thionyl bromide in good yield is reported. This unit can then be used in the synthesis of low bandgap materials via palladium-catalyzed coupling reactions. The approach offers a quick and easy way to prepare low bandgap materials as compared to the current literature methods.

- Synthesis of Anthracene-Stacked Oligomers and Polymer
Morisaki, Y.; Sawamura, T.; Murakami, T.; Chujo, Y. *Org. Lett.* **2010**, *12*, 3188–3191.

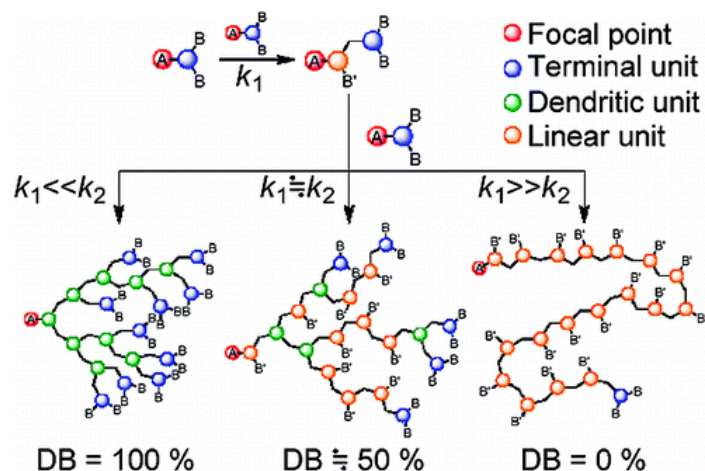
Abstract:



Anthracene-stacked oligomers and a polymer were synthesized using a xanthene skeleton as the scaffold, and their structures and properties were fully characterized. Intramolecular π - π stacking of the anthracene rings in the ground state and excited state was observed.

- Hyperbranched Polymers with Controlled Degree of Branching from 0 to 100%
Segawa, Y.; Higashihara, T.; Ueda, M. *J. Am. Chem. Soc.* **2010**, *132*, 11000–11001.

Abstract:



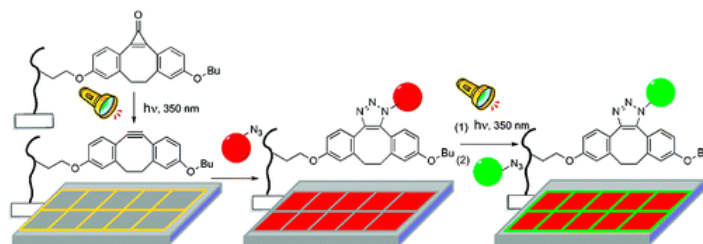
Controlled degree of branching (0-100 %)

A linear polymer, hyperbranched polymers with various degrees of branching, and 100% hyperbranched polymers were successfully synthesized by self-polycondensation of 2,2,2-trifluoro-1-[4-(4-phenoxyphenoxy)phenyl]ethanone by using different amounts of trifluoromethanesulfonic acid from the same AB2 monomer.

- High Density Orthogonal Surface Immobilization via Photoactivated Copper-Free Click Chemistry

Orski, S. V.; Poloukhine, A. A.; Arumugam, S.; Mao, L.; Popik, V. V.; Locklin, J. J. *Am. Chem. Soc.* **2010**, *132*, 11024–11026.

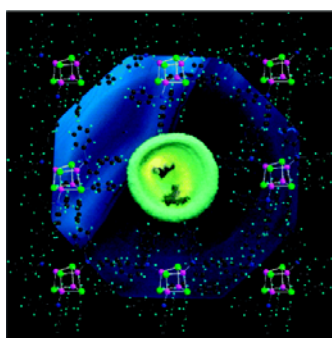
Abstract:



Surfaces containing reactive ester polymer brushes were functionalized with cyclopropanone-masked dibenzocyclooctynes for the light activated immobilization of azides using catalyst-free click chemistry. The photodecarbonylation reaction in the amorphous brush layer is first order for the first 45 s with a rate constant of 0.022 s^{-1} . The catalyst-free cycloaddition of surface bound dibenzocyclooctynes proceeds rapidly in the presence of azides under ambient conditions. Photolithography using a shadow mask was used to demonstrate patterning with multiple azide containing molecules. This surface immobilization strategy provides a general and facile platform for the generation of multicomponent surfaces with spatially resolved chemical functionality.

- Mechanochromic and Thermochemic Luminescence of a Copper Iodide Cluster
- Perruchas, S.; Le Goff, X. F.; Maron, S.; Maurin, I.; Guillen, F.; Garcia, A.; Gacoin, T.; Boilot, J.-P. *J. Am. Chem. Soc.* **2010**, *132*, 10967–10969.

Abstract:

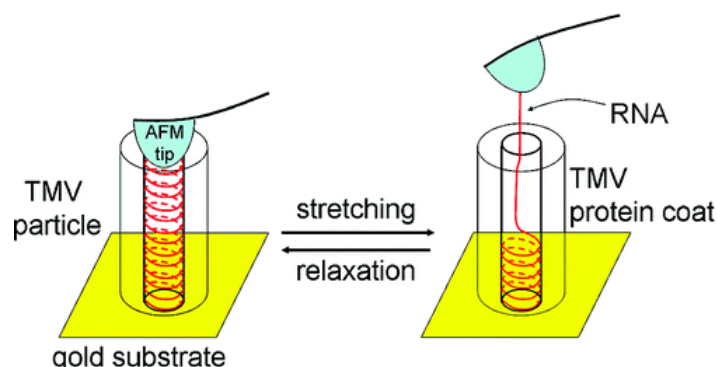


The mechanochromic and thermochemic luminescence properties of a molecular copper(I) iodide cluster formulated $[\text{Cu}_4\text{I}_4(\text{PPh}_2(\text{CH}_2\text{CH}=\text{CH}_2))_4]$ are reported. Upon mechanical grinding in a mortar, its solid-state emission properties are drastically modified as well as its thermochemic behavior. This reversible phenomenon has been attributed to distortions in the crystal packing leading to modifications of the intermolecular interactions and thus of the $[\text{Cu}_4\text{I}_4]$ cluster core geometry. Notably, modification of the Cu–Cu interactions seems to be involved in this phenomenon directly affecting the emissive properties of the cluster.

- Pulling Genetic RNA out of Tobacco Mosaic Virus Using Single-Molecule Force Spectroscopy
Liu, N.; Peng, B.; Lin, Y.; Su, Z.; Niu, Z.; Wang, Q.; Zhang, W.; Li, H.; Shen, J. *J. Am. Chem. Soc.* **2010**, *132*, 11036–11038.

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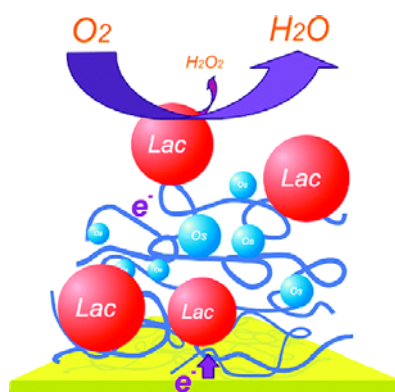
Abstract:



RNA-coat protein interactions in intact tobacco mosaic virus have been investigated for the first time directly on the single-molecule level by pulling the genetic RNA step by step out of the helical groove formed by its protein coat. The effects of pulling speed and pH on RNA-protein interactions are presented. In addition, the rebinding behavior of the detached RNA with the protein coat is discussed. Our results demonstrate the possibility of studying nucleic acid-protein interactions in more complicated systems using AFM-based single-molecule force spectroscopy.

- Layer-by-Layer Self-Assembled Osmium Polymer-Mediated Laccase Oxygen Cathodes for Biofuel Cells: The Role of Hydrogen Peroxide
Scodeller, P.; Carballo, R.; Szamocki, R.; Levin, L.; Forchiassin, F.; Calvo, E. *J. Am. Chem. Soc.* **2010**, *132*, 11132–11140.

Abstract:



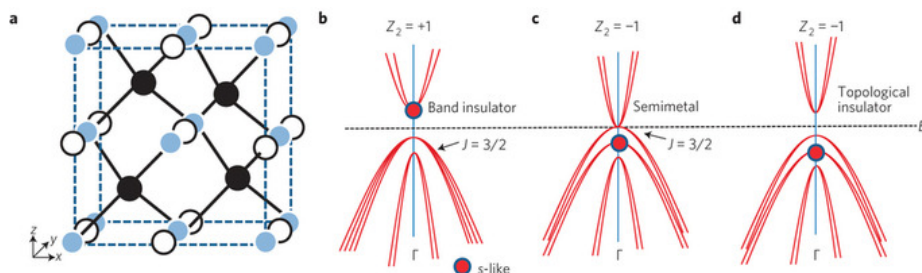
High potential purified *Trametes trogii* laccase has been studied as a biocatalyst for oxygen cathodes composed of layer-by-layer self-assembled thin films by sequential immersion of mercaptopropene sulfonate-modified Au electrode surfaces in solutions containing laccase and osmium-complex bound to poly(allylamine), (PAH-Os). The polycation backbone carries the Os redox relay, and the polyanion is the enzyme adsorbed from a solution of a suitable pH so that the protein carries a net negative charge. Enzyme thin films were characterized by quartz crystal microbalance, ellipsometry, cyclic voltammetry, and oxygen reduction electrocatalysis under variable oxygen partial pressures with a rotating disk electrode. New kinetic evidence relevant to biofuel cells is presented on the detection of traces of H₂O₂, intermediate in the O₂ reduction, with scanning electrochemical microscopy (SECM). Furthermore the inhibitory effect of peroxide on the biocatalytic current resulted in abnormal current dependence on the O₂ partial pressure and peak shape with hysteresis in the

polarization curves under stagnant conditions, which is offset upon stirring with the RDE. The new kinetic evidence reported in the present work is very relevant for the operation of biofuel cells under stagnant conditions of O₂ mass transport.

- Half-Heusler ternary compounds as new multifunctional experimental platforms for topological quantum phenomena

Lin, H.; Wray, L. A.; Xia, Y.; Xu, S.; Jia, S.; Cava, R. J.; Bansil, A.; Hasan, M. Z. *Nature Materials* **2010**, *9*, 546-549.

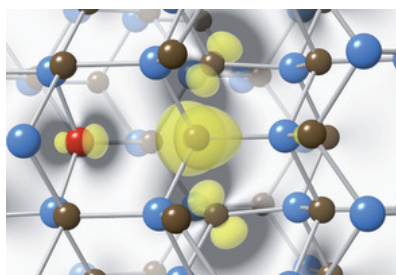
Abstract:



Recent discovery of spin-polarized single-Dirac-cone insulators, whose variants can host magnetism and superconductivity, has generated widespread research activity in condensed-matter and materials-physics communities. Some of the most interesting topological phenomena, however, require topological insulators to be placed in multiply connected, highly constrained geometries with magnets and superconductors, all of which thus require a large number of functional variants with materials design flexibility as well as electronic, magnetic and superconducting tunability. Given the optimum materials, topological properties open up new vistas in spintronics, quantum computing and fundamental physics. We have extended the search for topological insulators from the binary Bi-based series to the ternary thermoelectric Heusler compounds. Here we show that, although a large majority of the well-known Heuslers such as TiNiSn and LuNiBi are rather topologically trivial, the distorted LnPtSb-type (such as LnPtBi or LnPdBi, Ln=fn lanthanides) compounds belonging to the half-Heusler subclass harbour $Z_2 = -1$ topological insulator parent states, where Z_2 is the band purity product index. Our results suggest that half-Heuslers provide a new platform for deriving a host of topologically exotic compounds and their nanoscale or thin-film device versions through the inherent flexibility of their lattice parameter, spin-orbit strength and magnetic moment tunability paving the way for the realization of multifunctional topological devices.

- Quantum bits: Better than excellent
Di Vincenzo, D. *Nature Materials* **2010**, *9*, 468-469.

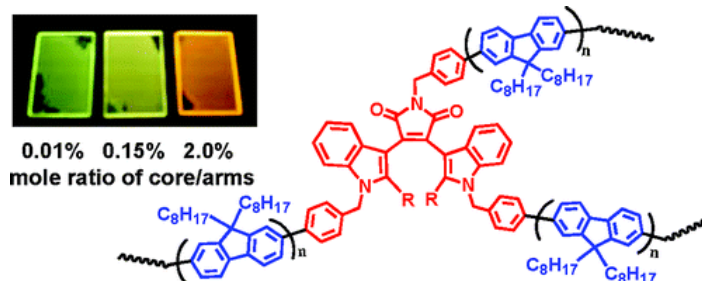
Abstract:



Nitrogen-vacancy centres in diamond are very promising candidates for quantum information processing in the solid state. However, a search to find defects with even more potential has now been launched.

- White Light-Emitting Devices Based on Star-Shape Polymers with a Bisindolylmaleimide Core
Lin, Z.; Lin, Y.-D.; Wu, C.-Y.; Chow, P.-T.; Sun, C.-H.; Chow, T. J. *Macromolecules* **2010**, *43*, 5925–5931.

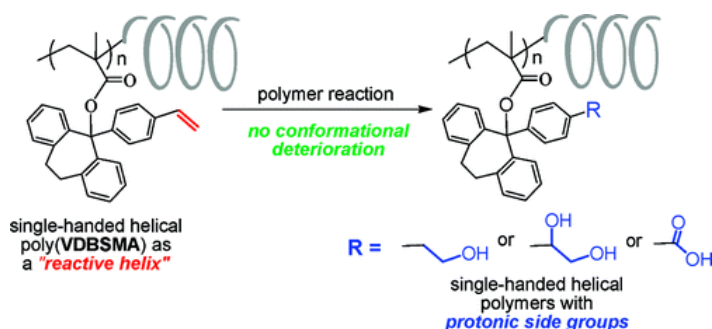
Abstract:



A new type of star-shape polymers employing bisindolylmaleimide dye (**2a–c**) as the core and poly(2,7-fluorene) (PF) and/or poly(2,7-carbazole) (PC) as the arms were synthesized. These materials exhibited dual emissions consisting of an intensive blue luminescence from PF or PC and an orange emission from maleimide a result of partial energy transfer between the two. Highly efficient white light emitting devices were fabricated using a single emitting film made by spin-coating method. The electroluminescence (EL) properties of the devices were investigated from several directions, such as the loading amount of maleimide core, the concentration dependent spectral changes, the difference in the composition of arms, and the substituent effect in the indole segment, etc. A typical device based on the star-shape polymer **MF001** containing 0.01 mol % of core exhibited a maximal luminous efficiency of 7.2 cd/A and external quantum efficiency of 3.2%. The device based on **MMF001** with a methyl substituent on the indole group can be improved to reaching a maximal brightness of 11450 cd/m², and that based on **MFC1001** with arms comprising equal amount of PF and PC can be boosted to a maximal power efficiency of 4.8 lm/w. All devices can be fabricated readily and turned on at a considerable low voltage (<5 V).

- A Reactive Helix: Synthesis, Chemical Modification, and Polymerization of an Optically Active Polymethacrylate
Sakamoto, T.; Nishikawa, T.; Fukuda, Y.; Sato, S.; Nakano, T. *Macromolecules* **2010**, *43*, 5956–5963.

Abstract:



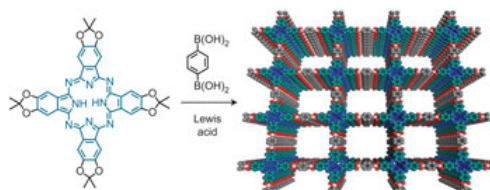
1-(*p*-Vinylphenyl)dibenzosuberyl methacrylate (**VDBSMA**) having two reactive vinyl groups in a molecule was synthesized and polymerized using α,α -azobis(isobutyronitrile) as a radical initiator and using the complexes of 9-fluorenyllithium with (*S*)-(+)-1-(2-pyrrolidinylmethyl)pyrrolidine, (–)-sparteine, and (*S,S*)-(+)-2,3-dimethoxy-1,4-bis(dimethylamino)butane as optically active anionic initiators. The free radical polymerization led to an insoluble material, indicating that both

methacrylic and styrenic moieties participated in the polymerization and a cross-linked gel was produced. In contrast, the anionic polymerization proceeded exclusively through the addition reaction of methacrylic moiety leaving the styrenic vinyl group intact leading to soluble polymers. The resulting poly(VDBSMA)s having a polymethacrylate-type main-chain structure were highly isotactic and showed high optical activity and intense circular dichroism (CD) spectra, indicating that the polymers have a single-handed helical conformation. Thus, a single-handed helical polymer having side-chain vinyl groups, which can be chemically modified, was successfully synthesized. The side-chain vinyl group was converted to 2-hydroxyethyl group, 1,2-dihydroxyethyl group, and carboxylic acid group by polymer reaction without seriously deteriorating the single-handed helical conformation of the polymer. In this way, single-handed helical polymers with side-chain protonic groups which would be difficult to be prepared by direct asymmetric anionic polymerization of the corresponding monomers were conveniently synthesized. In addition, radical polymerization of poly(VDBSMA) as a macromonomer afforded an optically active adduct consisting of single-handed helical chains.

- Lewis acid-catalysed formation of two-dimensional phthalocyanine covalent organic frameworks

Spitler, E. L.; Dichtel, W. R. *Nature Chemistry* **2010**, *2*, 672-677.

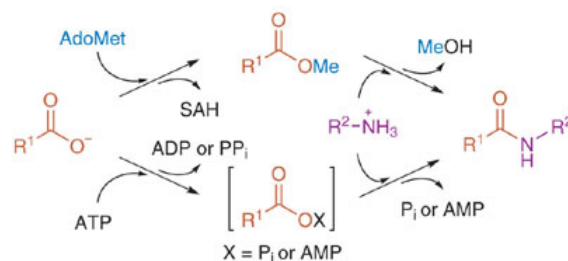
Abstract:



Covalent organic frameworks (COFs) offer a new strategy for assembling organic semiconductors into robust networks with atomic precision and long-range order. General methods for COF synthesis will allow complex building blocks to be incorporated into these emerging materials. Here we report a new Lewis acid-catalysed protocol to form boronate esters directly from protected catechols and arylboronic acids. This transformation also provides crystalline boronate ester-linked COFs from protected polyfunctional catechols and bis(boronic acids). Using this method, we prepared a new COF that features a square lattice composed of phthalocyanine macrocycles joined by phenylene bis(boronic acid) linkers. The phthalocyanines stack in an eclipsed fashion within the COF to form 2.3 nm pores that run parallel to the stacked chromophores. The material's broad absorbance over the solar spectrum, potential for efficient charge transport through the stacked phthalocyanines, good thermal stability and the modular nature of COF synthesis, show strong promise for applications in organic photovoltaic devices.

- An ATP-independent strategy for amide bond formation in antibiotic biosynthesis
Funabashi, M.; Yang, Z.; Nonaka, K.; Hosobuchi, M.; Fujita, Y.; Shibata, T.; Chi, X.; Van Lanen, S. G. *Nature Chem. Biol.* **2010**, *6*, 581-586.

Abstract:

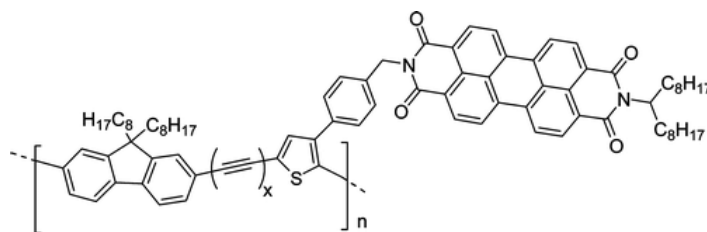


A-503083 B, a capuramycin-type antibiotic, contains an L-aminocaprolactam and an unsaturated hexuronic acid that are linked via an amide bond. A putative class C β -lactamase (CapW) was identified within the biosynthetic gene cluster that—in contrast to the expected β -lactamase activity—catalyzed an amide-ester exchange reaction to eliminate the L-aminocaprolactam with concomitant generation of a small but significant amount of the glyceryl ester derivative of A-503083 B, suggesting a potential role for an ester intermediate in the biosynthesis of capuramycins. A carboxyl methyltransferase, CapS, was subsequently demonstrated to function as an S-adenosylmethionine-dependent carboxyl methyltransferase to form the methyl ester derivative of A-503083 B. In the presence of free L-aminocaprolactam, CapW efficiently converts the methyl ester to A-503083 B, thereby generating a new amide bond. This ATP-independent amide bond formation using methyl esterification followed by an ester-amide exchange reaction represents an alternative to known strategies of amide bond formation.

- Synthesis of Conjugated Fluorene-*alt*-thiophene Polymers with Pendant Perylenediimide Units

Gómez, R.; Seoane, C.; Segura, J. L. *J. Org. Chem.* **2010**, *75*, 5099–5108.

Abstract:

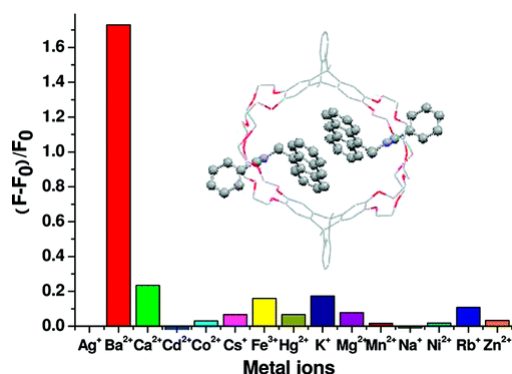


X= 0, PDI-PFT
X= 1, PDI-PFET

In this article we present the synthesis, characterization, electrochemical, optical, and preliminary photophysical investigation of two novel poly(fluorene-*alt*-thiophene) conjugated polymers endowed with pendant perylenediimide electron acceptor units. We show a route to the synthesis of easily functionalizable monomers paving the way to the preparation of a variety of functionalized polymers with different properties and applications and reflecting the versatility of this synthetic methodology.

- Complexation of Triptycene-Based Macrotricyclic Host toward (9-Anthracylmethyl)benzylammonium Salt: A Ba²⁺ Selective Fluorescence Probe
Zhao, J.-M.; Zong, Q.-S.; Chen, C.-F. *J. Org. Chem.* **2010**, *75*, 5092–5098.

Abstract:

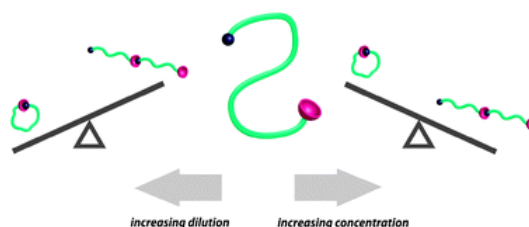


A new triptycene-based macrotricyclic host containing two dibenzo-30 crown-10 moieties (**1**) has been synthesized. It could form a 1:2 stable complex **1**·**3**₂ with (9-anthracylmethyl)benzylammonium salt (**3**) in both solution and solid state, in which the 9-anthracyl groups were selectively positioned inside the cavity of the host. Moreover, the complexation and disassociation of complex **1**·**3**₂ could be chemically controlled by the addition of base and acid. It was also found that Ba²⁺ ion could considerably induce the fluorescence enhancement of complex **1**·**3**₂, which might thus be utilized as a selective supramolecular fluorescence probe for Ba²⁺ ion. Fluorescence and ¹H NMR spectroscopic titrations further showed that the complexation between complex **1**·**3**₂ and barium ions underwent a two-step process.

- Single chain self-assembly: preparation of α,ω -donor-acceptor chains via living radical polymerization and orthogonal conjugation

Altintas, O.; Gerstel, P.; Dingenouts, N.; Barner-Kowollik, C. *Chem. Commun.* **2010**, *46*, 6291-6293.

Abstract:

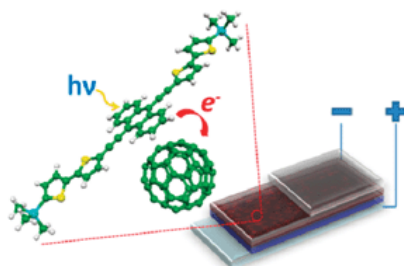


α,ω -Hydrogen donor/acceptor functional polymer strands are prepared *via* a combination of living radical polymerization and orthogonal conjugation and subsequently self-assembled as single chains to emulate—on a simple level—the self-folding behaviour of natural biomacromolecules.

- Monodispersed molecular donors for bulk hetero-junction solar cells: from molecular properties to device performances

Colella, S.; Mazzeo, M.; Grisorio, R.; Fabiano, E.; Melcarne, G.; Carallo, S.; Angione, M. D.; Torsi, L.; Suranna, G. P.; della Sala, F.; Mastroianni, P.; Gigli, G. *Chem. Commun.* **2010**, *46*, 6273-6275.

Abstract:

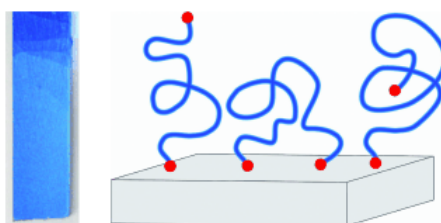


The relations between the chemical–physical properties of novel designed monodispersed donors and their photovoltaic performances are discussed. The importance of intermolecular interactions is emphasized to figure out the achievement of high performing bulk hetero-junction solar cells which are solution processed.

- Covalent Layer-by-Layer Assembly and Solvent Memory of Multilayer Films from Homobifunctional Poly(dimethylsiloxane)

Gill, R.; Mazhar, M.; Félix, O.; Decher, G. *Angew. Chem. Int. Ed.* **2010**, *49*, 6116–6119.

Abstract:

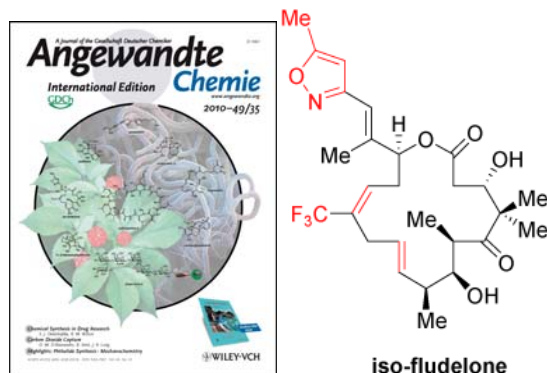


Catching the end groups: A simple procedure was used for the covalent layer-by-layer assembly of homobifunctional H₂N-poly(dimethoxysilane)-NH₂ on SiO₂ surfaces that leads to robust layer-by-layer films of optical quality (see picture; photo on left) despite the use of non-purified commercial starting materials. The films show a solvent memory for swelling and de-swelling when immersed in the corresponding solvent for each polymer.

- On the Reach of Chemical Synthesis: Creation of a Mini-Pipeline from an Academic Laboratory

Wilson, R. M.; Danishefsky, S. J. *Angew. Chem. Int. Ed.* **2010**, *49*, 6032–6056.

Abstract:



In this retrospective, we recall some select cases of synergy between very challenging chemical synthesis and the identification of promising new candidates for pharmaceuticals development. The progression from targets, often referred to as small molecules, to those of a size commonly associated with biologics (including glycoproteins) is also charted.