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#### Cover

See Christoph Weder, page 5378. The introduction of  $\pi$ -conjugated cross-links between conjugated macromolecules leads to network polymers with interesting electronic characteristics. Image reproduced by permission of Christoph Weder from *Chem. Commun.*, 2005, 5378.



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Inside cover

See F. Ekkehardt Hahn *et al.*, page 5390. A new route leading to complexes with imidazolin-2-ylidene ligands by template controlled cyclization of 2-azidoethyl isocyanide is presented. Image reproduced by permission of F. Ekkehardt Hahn, Volker Langenhahn and Tania Pape from *Chem. Commun.*, 2005, 5390.

#### CHEMICAL TECHNOLOGY

T41

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# **Chemical Technology**

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#### **40TH ANNIVERSARY ARTICLE**

#### 5373

#### Contemporary superconducting materials

R. J. Cava

Recently discovered superconductors are described from a chemical perspective and put in context.



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#### FEATURE ARTICLE

#### 5378

# Synthesis, processing and properties of conjugated polymer networks

#### Christoph Weder\*

The introduction of  $\pi$ -conjugated cross-links between conjugated macromolecules leads to network polymers that may offer interesting electronic characteristics, in particular improved charge transport. In this review, the synthesis, processing and electronic properties of such materials are discussed on the basis of selected examples.

#### COMMUNICATIONS

#### 5390

### Template synthesis of tungsten complexes with saturated N-heterocyclic carbene ligands

F. Ekkehardt Hahn,\* Volker Langenhahn and Tania Pape

A tungsten complex with an imidazolidin-2-ylidene ligand, **8**, was obtained from the isocyanide complex **5** by activation of the azido group in a Staudinger reaction followed by hydrolysis and cyclization to complex **7** and subsequent double *N*-alkylation.



#### 5393

#### Vibrational circular dichroism of *N*-acetyl-L-cysteine protected gold nanoparticles

Cyrille Gautier and Thomas Bürgi\*

Vibrational circular dichroism reveals the conformation of a chiral thiol, *N*-acetyl-L-cysteine, adsorbed on gold nanoparticles by a comparison between experimental and calculated spectra.



#### Non-stoichiometry induced by differential oxygen/lone pair occupation in chiral bicyclic 1,1'-binaphthoxy cyclodiphosphazanes

Manab Chakravarty, Praveen Kommana and K. C. Kumara Swamy\*

A set of chiral binaphthol based phosphorus compounds in which there is interchangeability of oxygen and lone pair positions that allows them to crystallize in an isostructural manner, and further to non-stoichiometry, is highlighted.







Yield up to 66 % d.r. (*cis:trans*) up to >19:1 Pinacol coupling of alkyl dinitrones mediated by  $SmI_2$  was achieved in the presence of a proton source allowing the synthesis of cyclic vicinal diamines with good *cis*-selectivity.

5405



5408



The unexpected similar second-order NLO response for nearly planar and largely twisted push-pull stilbazole chromophores: EFISH and theoretical TD-DFT evidence

Danika Locatelli, Silvio Quici, Dominique Roberto\* and Filippo De Angelis\*

The quadratic hyperpolarizability ( $\beta$ ) of planar (*E*)-4-[2-(4-(*N*-methyl-*N*-hexadecylamino)phenyl)ethenyl]pyridine (L<sup>1</sup>) and [Ir(CO)<sub>2</sub>ClL<sup>1</sup>] is similar to that of related but twisted ligand (L<sup>2</sup>) and [Ir(CO)<sub>2</sub>ClL<sup>2</sup>], respectively, showing that a planar structure *is not compulsory* to reach high  $\beta$ .

Unprecedented asymmetric induction through configurationally stable lithium *N*-( $\alpha$ -methylbenzyl)phosphinamides. A new entry to enantiomerically pure  $\gamma$ -aminophosphinic acids and esters

Ignacio Fernández, Gloria Ruiz Gómez, Ignacio Alfonso, María J. Iglesias and Fernando López Ortiz\*

The first examples of configurationally stable N-benzyl-N-phosphinoyl carbanions and their applications to the synthesis of homochiral  $\gamma$ -aminophosphinic acids and esters *via* highly enantioselective dearomatising reactions are described.

#### 5411

#### Binding of inorganic cations by *p*-sulfonatocalix[4]arene monitored through competitive fluorophore displacement in aqueous solution

Hüseyin Bakirci, Apurba L. Koner and Werner M. Nau\*

Binding of monovalent cations (alkali and ammonium) to the water-soluble *p*-sulfonatocalix[4]arene, which has previously evaded detection, can be sensitively monitored by competitive displacement of 2,3-diazabicyclo[2.2.2]oct-2-ene (DBO), a fluorescent azoalkane.

5414

# Superoxide dismutase-like activity of cobalt(II) complexes based on a sugar platform

François Bellot, Renaud Hardré, Giorgio Pelosi, Michel Thérisod and Clotilde Policar\*

In the strategy introduced here, sugars are used as a distribution frame that organizes Lewis bases in space to generate a chelation site for metal cation. Two crystallized Co(II) complexes with SOD-like activity are presented.





5417

#### $\pi$ -Face donor properties of N-heterocyclic carbenes

Marcus Süßner and Herbert Plenio\*

In order to fully account for the donor properties of N-heterocyclic carbenes, interactions of the  $\pi$ -face of the aryl substituents with the metal center have to be considered.

#### 5420

#### Synthesis of polypeptide based rod-coil block copolymers

Simone Steig, Frauke Cornelius, Peter Witte, Bastiaan B. P. Staal, Cor E. Koning, Andreas Heise and Henning Menzel\*

Synthesis of polypeptide based rod–coil block copolymers was accomplished employing a bifunctional initiator in a sequence of a nickel initiated polymerization of  $\gamma$ -benzyl-L-glutamate-*N*-carboxy anhydride and atom transfer radical polymerization of methyl methacrylate.







functionalized SWNTs: pitfalls in the use of chemical markers to determine the extent of sidewall functionalization in SWNTs

Lei Zhang, Jun Zhang, Nicolaus Schmandt, Justin Cratty, Valery N. Khabashesku, Kevin F. Kelly\* and Andrew R. Barron\*

STM measurements show that the use of Au nanoparticles as chemical markers for AFM imaging can lead to misleading results for substituent distribution.

Homochiral oligopeptides generated *via* an asymmetric induction in racemic 2D crystallites at the air–water interface; the system ethyl/thio-ethyl esters of long-chain amphiphilic  $\alpha$ -amino acids

Irina Rubinstein, Kristian Kjaer, Isabelle Weissbuch\* and Meir Lahav\*

 $N^{\varepsilon}$ -stearoyl-lysine-ethyl-ester is an efficient desymmetrizing agent for the generation of homochiral oligopeptides *via* a reaction catalyzed by Ag<sup>+</sup> in 2D *quasi*-racemic crystallites of the corresponding thio-ester self-assembled at the air-water interface.

#### 5432



#### 5435



# A unique example of a 3<sup>6</sup> tessellated 2-D net based on a tri-nuclear zinc(II)-1,4-benzenedicarboxylate framework

Colleen A. Williams, Alexander J. Blake, Peter Hubberstey\* and Martin Schröder\*

An unprecedented 3<sup>6</sup> tessellated 2-D sheet architecture in which tri-nuclear zinc(II)-containing building blocks are linked by bridging 1,4-benzenedicarboxylate (1,4-BDC) anions is adopted by  $\{[Zn_3(1,4-BDC)_3(DEF)_2] \cdot DEF\}_{\infty}$  (DEF = diethylformamide).

5438

# The inhibition of factor inhibiting hypoxia-inducible factor (FIH) by $\beta$ -oxocarboxylic acids

Biswadip Banerji, Ana Conejo-Garcia, Luke A. McNeill, Michael A. McDonough, Matthew R. G. Buck, Kirsty S. Hewitson, Neil J. Oldham and Christopher J. Schofield\*

Cyclic  $\beta$ -oxocarboxylic acids inhibit factor inhibiting hypoxia-inducible factor *via* ligation to the active site iron.

#### 5441

# Hydrogen-bond self-assembly of DNA-analogues into hexameric rosettes

Felaniaina Rakotondradany, Alison Palmer, Violeta Toader, Bingzhi Chen, M. A. Whitehead and Hanadi F. Sleiman\*

Triaminopyrimidine and cyanuric acid-based nucleosides undergo self-assembly into a DNA-analogue hexameric rosette, which subsequently aggregates into rod-like morphologies.

#### 5444

Four-electron reduction of dinitrogen during solution disproportionation of the organodimetallic  $(\eta-C_5Me_4R)_2Ta_2(\mu-Cl)_4$  (R = Me, Et) to a new  $\mu-\eta^1,\eta^1-N_2$  complex and odd-electron organotrimetallic cluster

Ting-Yu Lee, Alfred J. Wooten, Jeffrey J. Luci, Dale C. Swenson and Louis Messerle\*

The  $d^2-d^2$  organodimetallic  $(C_5Me_4R)_2Ta_2(\mu-Cl)_4$ disproportionates in toluene under  $N_2$  to the new organodimetallic  $N_2$  complex  $[(C_5Me_4R)TaCl_2]_2(\mu-N_2)$ and novel organotrimetallic cluster  $[(C_5Me_4R)_3Ta_3(\mu-Cl)_6][(C_5Me_4R)TaCl_4].$ 









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5453



5456



#### containing the exceptional racemic motifs originated from nine interwoven helices

An unprecedented fivefold interpenetrated lvt network

Xin-Long Wang, Chao Qin, En-Bo Wang,\* Yang-Guang Li and Zhong-Min Su\*

An unprecedented fivefold interpenetrated **lvt** network, containing the rare racemic motifs originated from nine interwoven helices, is reported, representing the highest degree of interpenetration presently known for 3D nets containing only planar four-coordinate nodes.

# ${[Bi_6F_{11}]}^{7+}\mbox{---an unusual, highly charged bismuth fluoro complex in (Se_4)[Bi_6F_{11}][AsF_6]_9\cdot 10~SO_2$

Johannes Beck\* and Folker Steden

The oxidation of Bi<sub>2</sub>Se<sub>3</sub> by AsF<sub>5</sub> in liquid SO<sub>2</sub> achives (Se<sub>4</sub>)[Bi<sub>6</sub>F<sub>11</sub>][AsF<sub>6</sub>]<sub>9</sub>·10 SO<sub>2</sub> as yellow crystals in high yield. Besides square-planar Se<sub>4</sub><sup>24</sup> ions the structure contains a unique, highly charged cationic bismuth fluoro cluster [Bi<sub>6</sub>F<sub>11</sub>]<sup>7+</sup> which is surrounded by [AsF<sub>6</sub>]<sup>-</sup> ions and coordinated SO<sub>2</sub> molecules.

### Synthesis of phosphorus esters by transesterification mediated by *N*-heterocyclic carbenes (NHCs)

Rohit Singh and Steven P. Nolan\*

The nucleophilic organic catalysts *N*-heterocyclic carbenes (NHCs) have been shown to effectively mediate the transesterification of phosphorus esters under mild conditions. The effect of various parameters on the efficiency of the protocol has been studied. User-friendly imidazolium salts can also be employed as pre-catalysts.

#### 5459

#### Synthesis of a new pair of fluorescence resonance energy transfer donor and acceptor dyes and its use in a protease assay

Eva Katharina Kainmüller, Eulàlia Pinyol Ollé and Willi Bannwarth\*

A new, efficient and very robust fluorescence resonance energy transfer (FRET) system, which can be measured in a normal as well as in a time-resolved mode, was developed and its feasibility demonstrated in a protease assay format.

#### 5462

# Isolation of an intermediate in the insertion of a carbodiimide into a boron-aryl bond

Nicholas J. Hill, Jennifer A. Moore, Michael Findlater and Alan H. Cowley\*

A 1 : 1 Lewis acid–base complex between CyN=C=NCy and PhBCl<sub>2</sub> has been isolated and structurally characterized, heating of which in refluxing toluene results in the amidinate,  $[PhC{NCy}_2]BCl_2$ ; the overall reaction has been modeled by DFT calculations.

#### 5465

### Luminescent oligo(tetraphenyl)silole nanoparticles as chemical sensors for aqueous TNT

Sarah J. Toal, Douglas Magde\* and William C. Trogler\*

Colloidal oligo(tetraphenyl)silole nanoparticles in THF/H<sub>2</sub>O suspensions show increased luminescence and offer a method to detect TNT as low as 20 ppb in an aqueous environment.

#### 5468

#### Highly selective photo-catalytic dimerization of α-methylstyrene by a novel palladium complex with photosensitizing ruthenium(II) polypyridyl moiety

Akiko Inagaki,\* Shinichi Edure, Shinichi Yatsuda and Munetaka Akita\*

A novel dinuclear Ru…Pd complex containing a photo-sensitizing unit and the Pd center was effective toward selective dimerization of  $\alpha$ -methylstyrene to give 2,4-diphenyl-4-methyl-1-pentene under visible-light irradiated conditions.









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