

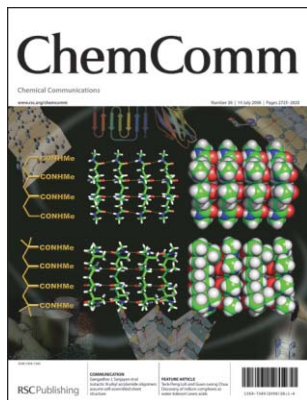
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## IN THIS ISSUE

ISSN 1359-7345 CODEN CHCOFS (26) 2725–2820 (2006)



### Cover

See Gangadhar J. Sanjayan *et al.*, page 2756.  
The image shows the ability of isotactic *N*-acrylamide oligomers to assume self-assembled sheet structures, reminiscent of protein  $\beta$ -sheets. Image reproduced by permission of Amol Kendhale, Rajesh Gonnade, Pattuparampil R. Rajamohan and Gangadhar J. Sanjayan from *Chem. Commun.*, 2006, 2756.



### Inside cover

See Yunqi Liu *et al.*, page 2750.  
High performance solution processed organic thin film field-effect transistors based on benzene-fused bis(tetrathiafulvalene) compounds. Image reproduced by permission of Xike Gao, Weiping Wu, Yunqi Liu, Wenfeng Qiu, Xiaobo Sun, Gui Yu and Daoben Zhu from *Chem. Commun.*, 2006, 2750.

## CHEMICAL TECHNOLOGY

T25

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## Chemical Technology

July 2006/Volume 3/Issue 7

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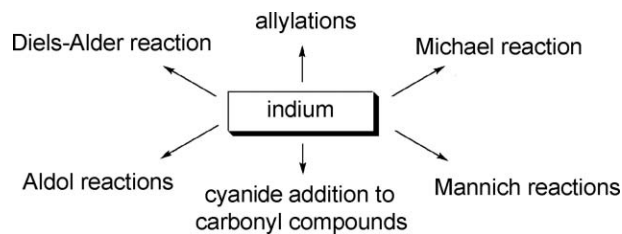
## FEATURE ARTICLE

2739

### Discovery of indium complexes as water-tolerant Lewis acids

Teck-Peng Loh\* and Guan-Leong Chua

This article describes our work on the use of indium complexes as catalysts in various carbon–carbon bond forming reactions.



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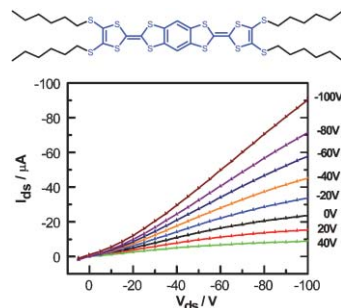
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2750

**A facile synthesis of linear benzene-fused bis(tetrathiafulvalene) compounds and their application for organic field-effect transistors**

Xike Gao, Weiping Wu, Yunqi Liu,\* Wenfeng Qiu, Xiaobo Sun, Gui Yu and Daoben Zhu\*

Three new linear benzene-fused bis-TTF compounds (**1–3**) were readily synthesized; a solution processed organic field-effect transistor based on **2** shows high mobility of  $0.02 \text{ cm}^2/\text{Vs}$ .

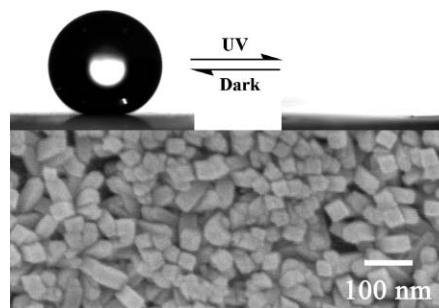


2753

**UV-Manipulated wettability between superhydrophobicity and superhydrophilicity on a transparent and conductive SnO<sub>2</sub> nanorod film**

Weiqin Zhu, Xinjian Feng, Lin Feng and Lei Jiang\*

A smart surface with wettability that can be switched between superhydrophobicity and superhydrophilicity has been realized on a transparent and conductive SnO<sub>2</sub> nanorod film by the alternation of UV-irradiation and dark storage.

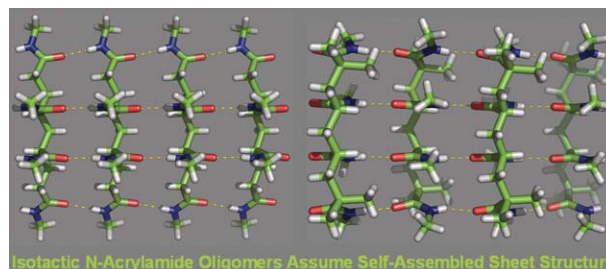


2756

**Isotactic *N*-alkyl acrylamide oligomers assume self-assembled sheet structure: first unequivocal evidence from crystal structures**

Amol Kendhale, Rajesh Gonnade, Pattuparampil R. Rajamohanam\* and Gangadhar J. Sanjayam\*

This communication reports the first unequivocal evidence of the ability of isotactic *N*-alkyl acrylamide oligomers to assume self-assembled sheet-like structures that are reminiscent of protein  $\beta$ -sheets.

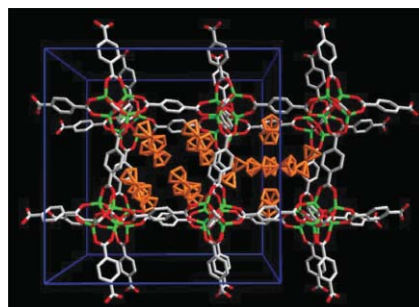


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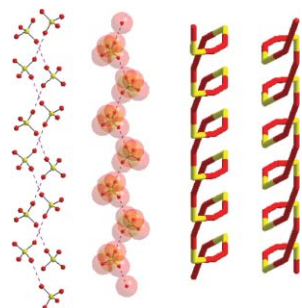
**Vapor phase inclusion of ferrocene and its derivative in a microporous metal-organic porous material and its structural characterization by single crystal X-ray diffraction**

Hyunuk Kim, Hyungphil Chun, Ghyung-Hwa Kim, Heung-Soo Lee and Kimoon Kim\*

The inclusion of ferrocene and its derivative in MOF-5 is achieved by vapor diffusion; single-crystal X-ray diffraction studies using synchrotron radiation of ferrocene-loaded MOF-5 reveal well-ordered guest molecules packed into the pores.



2762

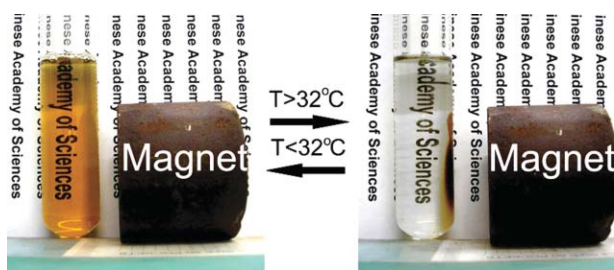


### Sulfate anion helices formed by the assistance of a flip-flop water chain

Pallepogu Raghavaiah, Sabbani Supriya and Samar K. Das\*

A flip-flop chainlike extended structure of water tetramers assists the supramolecular construction of sulfate anion helices that are formed *via* O $\cdots$ O non-covalent non-hydrogen bonded interaction in a simple inorganic–organic compound [C<sub>6</sub>H<sub>10</sub>N<sub>2</sub>]SO<sub>4</sub>·1.5H<sub>2</sub>O

2765

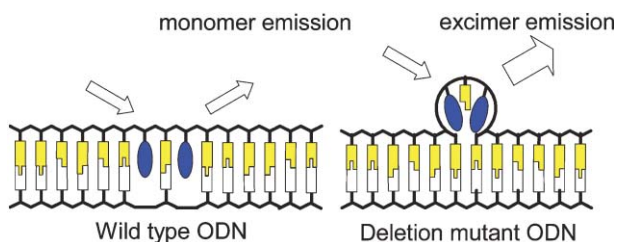


### Magnetic separation of polymer hybrid iron oxide nanoparticles triggered by temperature

Yabin Sun, Xiaobin Ding,\* Zhaohui Zheng, Xu Cheng, Xinhua Hu and Yuxing Peng\*

The water dispersion of poly-*N*-isopropylacrylamide hybrid nanoparticles exhibited temperature-triggered magnetic separation behaviour. If the temperature switched between below and above 32 °C, the nanoparticles could be dispersed into water and reversibly separated by a magnetic field of 1.1 T.

2768

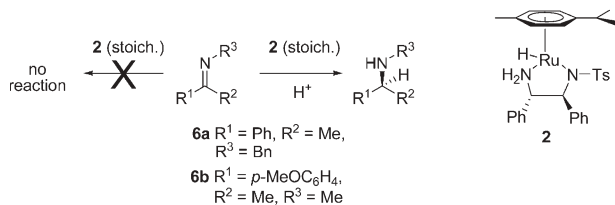


### Insertion of two pyrene moieties into oligodeoxyribonucleotides for the efficient detection of deletion polymorphisms

Hiromu Kashida, Hiroyuki Asanuma\* and Makoto Komiyama

For the detection of deletion polymorphisms, two pyrene moieties are tethered to an oligodeoxyribonucleotide (ODN). One- and two-base deletions can be selectively detected by the strength of the excimer emission.

2771



### Mechanistic investigation on the hydrogenation of imines by [*p*-(Me<sub>2</sub>CH)C<sub>6</sub>H<sub>4</sub>Me]RuH(NH<sub>2</sub>CHPhCHPhNSO<sub>2</sub>-C<sub>6</sub>H<sub>4</sub>-*p*-CH<sub>3</sub>). Experimental support for an ionic pathway

Jenny B. Åberg, Joseph S. M. Samec and Jan-E. Bäckvall\*

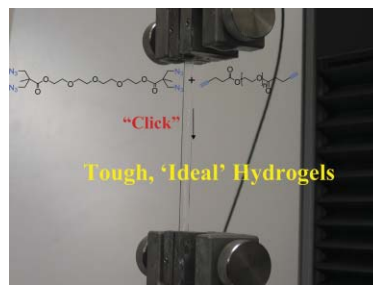
The need for acidic activation in the stoichiometric hydrogenation of imines **6a** or **6b** by Noyori's catalyst [*p*-(Me<sub>2</sub>CH)C<sub>6</sub>H<sub>4</sub>Me]RuH(NH<sub>2</sub>CHPhCHPhNSO<sub>2</sub>-C<sub>6</sub>H<sub>4</sub>-*p*-CH<sub>3</sub>) (**2**) is inconsistent with the proposed concerted mechanism and supports an ionic mechanism.

2774

### Synthesis of well-defined hydrogel networks using Click chemistry

Michael Malkoch, Robert Vestberg, Nalini Gupta, Laetitia Mespouille, Philippe Dubois, Andrew F. Mason, James L. Hedrick,\* Qi Liao, Curtis W. Frank, Kevin Kingsbury and Craig J. Hawker\*

New PEG-based hydrogel materials have been synthesized by Click chemistry and shown to result in well-defined networks having significantly improved mechanical properties.



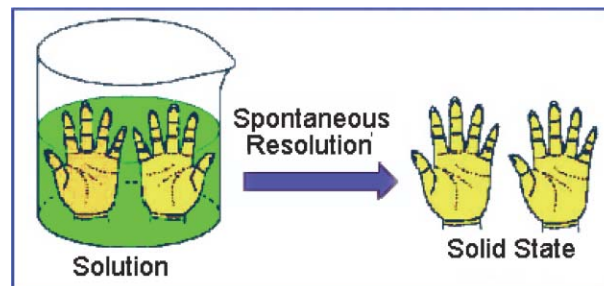
Extension 1500 %

2777

### Spontaneous resolution of silver double helicates consisting of achiral ligands with several aromatic rings

Qiaozhen Sun, Yan Bai, Guangjie He, Chunying Duan,\* Zhihua Lin and Qingjin Meng\*

Symmetric breaking of silver double helicates through spontaneous crystallization was achieved *via* incorporation of C–H... $\pi$  and  $\pi$ – $\pi$  stacking interactions of achiral ligands consisting of several aromatic rings.

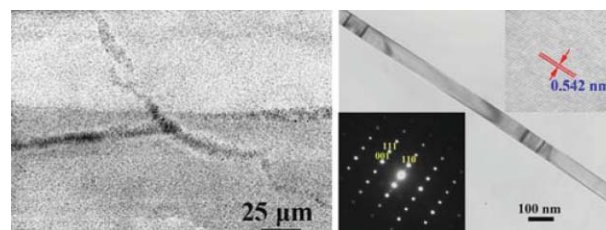


2780

### Fluoride-assisted synthesis of mullite ( $\text{Al}_{5.65}\text{Si}_{0.35}\text{O}_{9.175}$ ) nanowires

Yongjun Chen,\* Bo Chi, Qiuxiang Liu, Denise C. Mahon and Ying Chen

Mullite single-crystal nanowires were first synthesized by a simple method with a composition of  $\text{Al}_{5.65}\text{Si}_{0.35}\text{O}_{9.175}$ ; the intermediate fluoride species play a critical role during the nanowire growth process. These nanowires have strong photoluminescence (PL) emission bands at 310, 397, 452 and 468 nm.

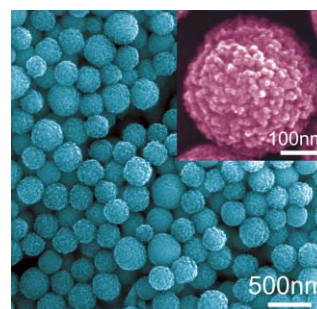


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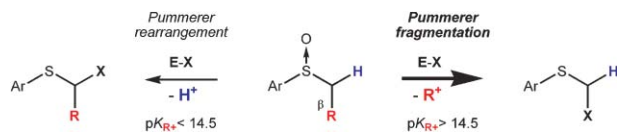
### Synthesis of hierarchically mesoporous anatase spheres and their application in lithium batteries

Yu-Guo Guo, Yong-Sheng Hu\* and Joachim Maier

Hierarchically mesoporous  $\text{TiO}_2$  (anatase) sub-micron spheres with uniform particle size exhibiting high Li storage capacity and good cycling performance have been successfully prepared in a large quantity by using  $\text{TiO}_2$ – $\text{CdSO}_4$  composite as intermediate.



2786

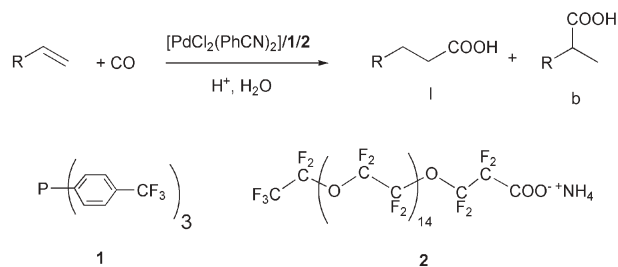


### Pummerer fragmentation vs. Pummerer rearrangement: a mechanistic analysis

Benoît Laleu, Marco Santarem Machado and Jérôme Lacour\*

Depending upon the nature of the substituent at the  $\beta$ -position of the sulfoxide moiety, a Pummerer reaction can be oriented “at will” towards  $\text{C}_\alpha\text{-H}$  (rearrangement) or  $\text{C}_\alpha\text{-C}_\beta$  (fragmentation) bond cleavage.

2789

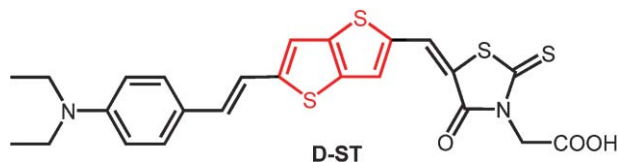


### Hydrocarboxylation of terminal alkenes in supercritical carbon dioxide using perfluorinated surfactants

Clara Tortosa-Estorach, Núria Ruiz and Anna M. Masdeu-Bultó\*

High selectivity in acids is obtained in the first example of hydrocarboxylation of 1-octene in supercritical carbon dioxide using a  $\text{Pd}/\text{P}(\text{4-C}_6\text{H}_4\text{-CF}_3)_3$  catalyst system and a perfluorinated surfactant **2**.

2792

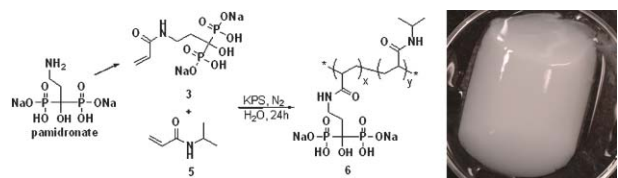


### Novel organic dyes for efficient dye-sensitized solar cells

Shao-Lu Li, Ke-Jian Jiang,\* Ke-Feng Shao and Lian-Ming Yang\*

A novel organic dye containing thienothiophene segments was developed, and nano-crystalline  $\text{TiO}_2$  dye-sensitized solar cells were fabricated with 6.23% of the overall conversion efficiency ( $\eta$ ) under AM 1.5 irradiation: short-circuit current density ( $J_{\text{sc}}$ )  $15.23 \text{ mA cm}^{-2}$ ; open-circuit photovoltage ( $V_{\text{oc}}$ ) 0.56 V; and fill factor ( $ff$ ) 0.73.

2795



### The first pamidronate containing polymer and copolymer

Ling Wang, Min Zhang, Zhimou Yang and Bing Xu\*

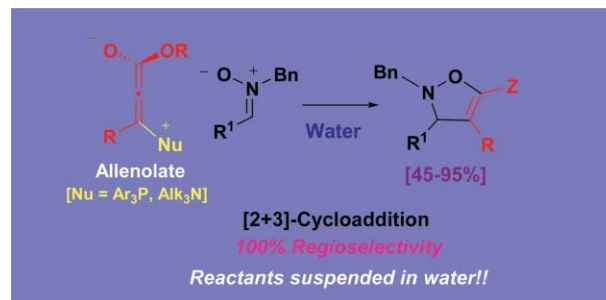
A new monomer, *N*-acryl pamidronate (**3**), has been synthesized, and its crosslinked copolymer (**6**) can form a hydrogel that serves as the substrate for direct biomineralization (e.g., the formation of hydroxyapatites).

2798

**Organocatalysis “on water”. Regioselective [3 + 2]-cycloaddition of nitrones and allenolates**

David González-Cruz, David Tejedor, Pedro de Armas,\* Ezequiel Q. Morales and Fernando García-Tellado\*

The first example of a regioselective and organocatalyzed 1,3-dipolar cycloaddition reaction between conjugated allenolates and nitrones “on water” is described.

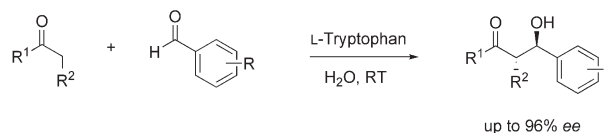


2801

**Asymmetric aldol reactions catalyzed by tryptophan in water**

Zhaoqin Jiang, Zhian Liang, Xiaoyu Wu and Yixin Lu\*

Tryptophan was shown to be able to catalyze direct aldol reactions between various cyclic ketones and aromatic aldehydes in water with high enantioselectivity.

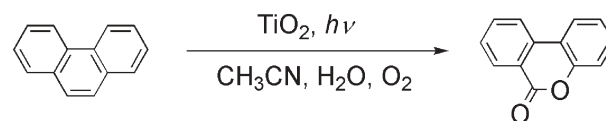


2804

**Synthesis of a coumarin compound from phenanthrene by a TiO<sub>2</sub>-photocatalyzed reaction**

Suguru Higashida,\* Aiko Harada, Rikako Kawakatsu, Noriko Fujiwara and Michio Matsumura\*

Phenanthrene was converted into a coumarin compound by a TiO<sub>2</sub>-photocatalyzed reaction in an acetonitrile solution containing 8 wt% water and molecular oxygen in 45% yield.

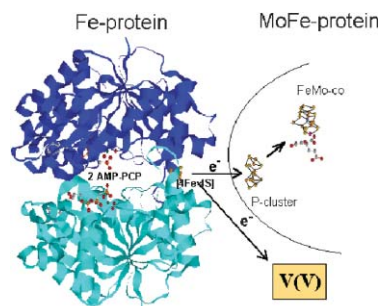


2807

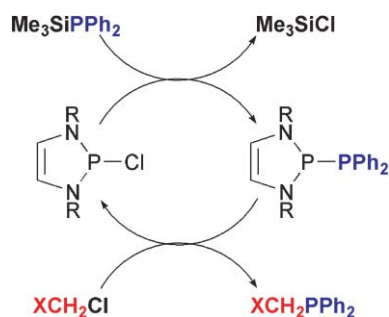
**Vanadium(V) is reduced by the ‘as isolated’ nitrogenase Fe-protein at neutral pH**

Karl Fisher, David J. Lowe and Jan Petersen\*

A redox-active protein, the nitrogenase Fe-protein, is presented that is able to reduce orthovanadate depending on the oxidation state of its [4Fe-4S] cluster in a manner that does not require a nucleotide-dependent conformational rearrangement.



2810

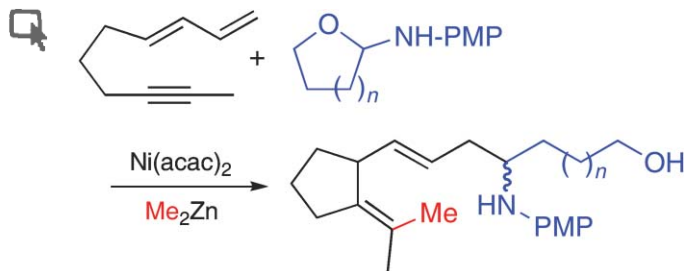


### Phosphorus-carbon bond formation catalysed by electrophilic *N*-heterocyclic phosphines

Sebastian Burck, Daniela Förster and Dietrich Gudat\*

A *P*-chloro-diazaphospholene catalyses the phosphorus-carbon bond formation reaction between diphenylsilylphosphine and various alkyl chlorides.

2813

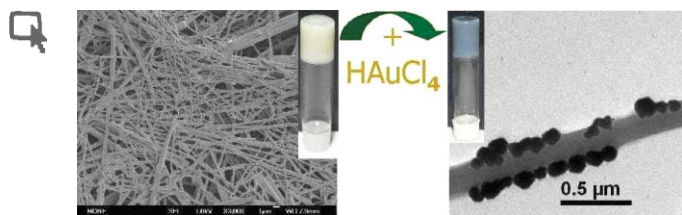


### Nickel catalyzed stereoselective conjugate addition of dimethylzinc upon aldimines across 1,3-dien-8-yne and 1,3-dien-9-yne

Masanari Kimura, Masahiko Mori, Nahoko Mukai, Keisuke Kojima and Yoshinao Tamaru\*

Nickel(0) catalyzes multi-component connection of  $\text{Me}_2\text{Zn}$ , alkynes, dienes, aldehydes and anisidine, furnishing dienyl amines in good yields.

2816



### Smart oligopeptide gels: *in situ* formation and stabilization of gold and silver nanoparticles within supramolecular organogel networks

Sudipta Ray, Apurba Kumar Das and Arindam Banerjee\*

Tripeptide with redox active tyrosine based smart organogels have been used for *in situ* formation and stabilization of gold and silver nanoparticles within the supramolecular gel networks and the gold nanoparticles are aligned in arrays along the gel nanofibers of peptide 1-toluene gels.



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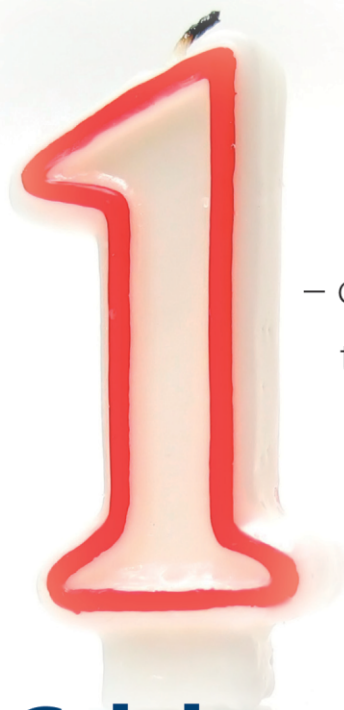
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