



The following Communications have been judged by at least two referees to be "very important papers" and will be published online at www.angewandte.org soon:

S. T. Scroggins, Y. Chi, J. M. J. Fréchet*

Polarity-Directed One-Pot Asymmetric Cascade Reactions Mediated by Two Catalysts in an Aqueous Buffer

A. B. Chaplin, A. S. Weller*

B-H Activation at a Rhodium(I) Center: A Missing Link in the Transition-Metal-Catalyzed Dehydrocoupling of Amine-Boranes

G. de Ruiter, E. Tartakovsky, N. Oded, M. E. van der Boom* Sequential Logic Operations with Surface-Confined Polypyridyl **Complexes Having Molecular Random Access Memory Features**

W. Li, P. H. C. Camargo, L. Au, Q. Zhang, M. Rycenga, Y. Xia* Etching and Dimerization: A Simple and Versatile Route to Dimers of Silver Nanospheres with a Range of Sizes

K. Fesko, M. Uhl, J. Steinreiber, K. Gruber, H. Griengl* Biocatalytic Access to α,α -Dialkyl- α -Amino Acids by a Mechanism-Based Approach

I. U. Khan, D. Zwanziger, I. Böhme, M. Javed, H. Naseer, S. W. Hyder, A. G. Beck-Sickinger*

Breast Cancer Diagnosis by Neuropeptide Y Analogues: From Synthesis to Clinical Application

T. Yokoi, M. Yoshioka, H. Imai, T. Tatsumi*

Diversification of RTH-type Zeolite and Its Catalytic Application

Y.-S. Li,* F.-Y. Liang, H. Bux, A. Feldhoff, W.-S. Yang, J. Caro* Metal-Organic Framework Molecular Sieve Membrane: Supported ZIF-7 Layer with High Hydrogen Selectivity by Microwave-Assisted Seeded Growth

S. Yamago, * Y. Watanabe, T. Iwamoto

Synthesis of [8]Cycloparaphenylene from a Square-Shaped Tetranuclear Platinum Complex [{Pt(cod)(4,4'-biphenyl)}₄]

Vu Hong, S. I. Presolski, C. Ma, M. Finn*

Analysis and Optimization of Copper-Catalyzed Azide-Alkyne Cycloaddition for Bioconjugation

Author Profile



M. lansen

Heterocycles

"The secret of being a successful scientist is common Guy C. Lloyd-Jones sense, curiosity, and following one's nose ... The part of my job which I enjoy the most is the occasional "eureka!" moment. ..." This and more about Guy C. Lloyd-Jones can be found on page 9588.

News

P. J. Stang



A. de Meijere

Solid-State Chemistry: M. Jansen Awarded _

Inorganic Chemistry: Prize for P. J. Stang -

Organic Chemistry: A. de Meijere Honored ____

Books

Elements of Synthesis Planning R. W. Hoffmann reviewed by U. Rinner, J. Mulzer ___ 9590

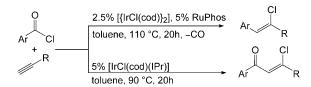
Asymmetric Synthesis of Nitrogen Jacques Royer reviewed by A. Riera _____ 9590

Highlights

Transition-Metal Catalysis

L. J. Gooßen,* N. Rodríguez, K. Gooßen _______ **9592 – 9594**

Stereoselective Synthesis of β -Chlorovinyl Ketones and Arenes by the Catalytic Addition of Acid Chlorides to Alkynes



New cats, new tricks: Complementary iridium catalysts enable the Z-selective catalytic addition of acid chlorides to alkynes. Depending on the ligand, the reaction proceeds with or without decarbonylation to give β -chlorovinyl-substi-

tuted arenes or ketones: useful intermediates for the synthesis of heterocycles. cod = cyclooctadiene, IPr = 1,3-bis(2,6-diisopropylphenyl)imidazol-2-ylidene), RuPhos = 2-dicyclohexylphosphanyl-2',6'-diisopropoxy-1,1'-biphenyl.

Correspondence

Chemistry Databases

D. Seebach,* E. Zass, W. B. Schweizer, A. J. Thompson, A. French, B. G. Davis,* G. Kyd, I. J. Bruno* ______ 9596 – 9598

Polymer Backbone Conformation—A Challenging Task for Database Information Retrieval



Look again: The X-ray single crystals structure determination of polyethylene glycol chains reported at the beginning of 2009 was not the first X-ray structure. The fact that old fiber and freeze-dried struc-

ture reports from the 1960s were overlooked points out weak spots in searches of chemical and crystallographic databases.

Minireviews

Chiral Resolution

W. L. Noorduin, E. Vlieg, R. M. Kellogg, B. Kaptein* ______ **9600 – 9606**

From Ostwald Ripening to Single Chirality



The rich get richer and the poor get poorer: More than 100 years ago the 1909 Nobel laureate Wilhelm Ostwald explained how large crystals grow at the expense of small crystals. This principle forms the basis for the recently discovered method for the conversion of racemic crystal mixtures into homochiral crystals by grinding-induced attrition.

For the USA and Canada:

ANGEWANDTE CHEMIE International Edition (ISSN 1433-7851) is published weekly by Wiley-VCH, PO Box 191161, 69451 Weinheim, Germany. Air freight and mailing in the USA by Publications Expediting Inc., 200 Meacham Ave., Elmont, NY 11003. Periodicals postage paid at Jamaica, NY 11431. US POST-MASTER: send address changes to *Angewandte Chemie*, Wiley-VCH, 111 River Street, Hoboken, NJ 07030. Annual subscription price for institutions: US\$ 9442/8583 (valid for print and

electronic / print or electronic delivery); for individuals who are personal members of a national chemical society prices are available on request. Postage and handling charges included. All prices are subject to local VAT/ sales tax.





The "Lord of the Rings": The direct chemical manipulation of the indole system is a long-standing synthetic shortcut to challenging molecular architectures which recently entered a new dimension through the introduction of

innovative catalytic systems and techniques. This Review highlights the new aspects that have had made a deep impact on this topic over the last few years: efficiency, selectivity, and environmental friendliness.

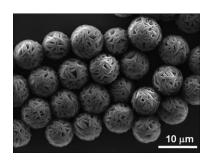
Reviews

Indole Chemistry

M. Bandini,* A. Eichholzer _ 9608 - 9644

Catalytic Functionalization of Indoles in a New Dimension

Holey balls! Novel microspheres made up of nanoplates have been fabricated by porphyrin-polymer-assisted supramolecular self-assembly of C_{60} . The obtained C_{60} microspheres are single-crystalline and exhibit pure *fcc* structure. This is a rare example of a hierarchical supramolecular architecture fabricated by the self-assembly of unmodified C_{60} .



Communications

Fullerene Nanostructures

X. Zhang, M. Takeuchi* ____ 9646 - 9651

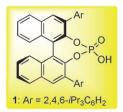
Controlled Fabrication of Fullerene C₆₀ into Microspheres of Nanoplates through Porphyrin-Polymer-Assisted Self-Assembly



desymmetrization
1 (5–10 mol%)

n-hexane
70 °C
24–96 h

64–95% yield up to 94% ee



selectivity (see scheme). To clarify the origin of the enantioselectivity ONIOM calculations were carried out

Asymmetric Synthesis

K. Mori, T. Katoh, T. Suzuki, T. Noji, M. Yamanaka, T. Akiyama* _ **9652 - 9654**

Chiral Phosphoric Acid Catalyzed Desymmetrization of *meso-*1,3-Diones: Asymmetric Synthesis of Chiral Cyclohexenones



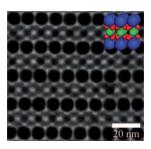
Three's company: The first genuine ternary colloidal crystal (see picture) is composed of PbSe nanocrystals of two different diameters (blue and green) and of CdSe nanocrystals (red). Electron tomography shows that the superlattice is isostructural with the atomic lattice AlMgB₄.

Chiral effectiveness: The title transforma-

substrates to give chiral cyclohexenones

in high yields and with excellent enantio-

tion is applicable to a wide variety of



Nanoparticle Superlattices

W. H. Evers, H. Friedrich, L. Filion, M. Dijkstra,

D. Vanmaekelbergh* _____ 9655 - 9657

Observation of a Ternary Nanocrystal Superlattice and Its Structural Characterization by Electron Tomography



Frontiers of Chemistry: From Molecules to Systems

A One-Day Symposium

On 21st May 2010 in Paris

at the Maison de la Chimie

(near the Eiffel Tower and Les Invalides)

Speakers



Gerhard Ertl Nobel Prize 2007



Jean-Marie Lehn
Nobel Prize 1987



Roger Y. Tsien
Nobel Prize 2008



Ada Yonath Nobel Prize 2009



Luisa De Cola



Alan R. Fersht



Marc Fontecave



Michael Grätzel



Michel Orrit



Nicolas Winssinger

Scientific committee

Celebrating 10 Years of

CHEM BIOCHEM

CHEMPHYSCHEM

E. Amouyal, M. Che, F. C. De Schryver, A. R. Fersht, P. Gölitz, J. T. Hynes, J.-M. Lehn

Posters

will be displayed also online from 1st April.

www.chembiophyschem.org

Topics

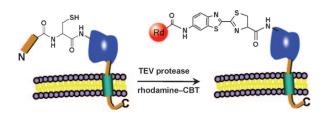
catalysis, biochemical imaging, chemical biology, bionanotechnology, proteomics, spectroscopy, solar cells











Going live: A protein-labeling method based on the use of a single amino acid tag—an N-terminal cysteine residue—and small-molecule probes containing a cyanobenzothiazole (CBT) unit has been used for the specific fluorescence labeling

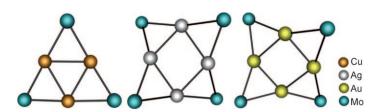
of proteins in vitro and at the surface of live cells (see scheme). This simple ligation reaction proceeds with a high degree of specificity under physiological conditions. Rd: a rhodamine dye; TEV: tobacco etch virus.

Protein Labeling

H. Ren, F. Xiao, K. Zhan, Y.-P. Kim, H. Xie, Z. Xia, J. Rao* _______ 9658 – 9662

A Biocompatible Condensation Reaction for the Labeling of Terminal Cysteine Residues on Proteins





Gilded rafts: Oligomeric 2D raft clusters $\{M[m]\}_n$ (M = Cu, n = 3; M = Ag or Au, n = 4; see picture) with the same bridging metalloligand [m] = $\{CpMo(CO)_3\}$ were prepared and structurally characterized. The v_2 -triangular (M = Cu) or v_2 -square

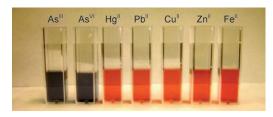
(M = Ag, Au) structures of their metalmetal-bonded cores allow comparative evaluation of the d^{10} ... d^{10} interactions, and theoretical calculations point to a favorable contribution of diagonal Au···Au or Ag···Ag interactions.

Metal-Metal Interactions

S. Sculfort, P. Croizat, A. Messaoudi, M. Bénard,* M.-M. Rohmer, R. Welter, P. Braunstein* ______ 9663 – 9667

Two-Dimensional Triangular and Square Heterometallic Clusters: Influence of the Closed-Shell d¹⁰ Electronic Configuration

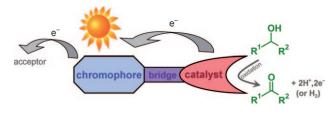




Low level: The amount of arsenic in Bangladeshi well water and in bottled drinking water and Mississippi tap water are indicated by a dynamic light scattering (DLS) assay. Label-free gold nanoparticles are used in a selective colorimetric assay (see picture) and in a highly sensitive DLS assay for the recognition of arsenic in concentrations as low as 3 ppt.

Arsenic Detection

Use of Gold Nanoparticles in a Simple Colorimetric and Ultrasensitive Dynamic Light Scattering Assay: Selective Detection of Arsenic in Groundwater



A chromophore—catalyst dyad assembly of ruthenium polypyridyl complexes has been prepared, structurally and electronically characterized, and its proton-coupled multielectron photooxidation reactivity demonstrated by the visible sunlight-

driven catalytic oxidation of aliphatic and benzyl alcohols into their corresponding aldehydes or ketones with high selectivities and over 100 turnover cycles in water, at ambient conditions.

Oxidation Photocatalysis

W. Chen, F. N. Rein, R. C. Rocha* _______ 9672 – 9675

Homogeneous Photocatalytic Oxidation of Alcohols by a Chromophore–Catalyst Dyad of Ruthenium Complexes



Contents

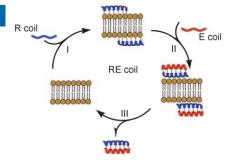
Membrane-Binding Peptides

M. G. Ryadnov,* G. V. Mukamolova, A. S. Hawrani, J. Spencer, R. Platt -

9676 - 9679



RE Coil: An Antimicrobial Peptide Regulator



Peptides that make bacteria RE coil: A peptide system designed to regulate antimicrobial intervention switches between antimicrobial and inactive forms. The regulator comprises two α -helical sequences. One of them, R coil, binds to microbial membranes and acts as an antimicrobial component, and is inactivated by the other, E coil, a membraneinactive peptide (see picture).

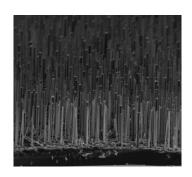
Photovoltaic Devices

G. Yuan, H. Zhao, X. Liu, Z. S. Hasanali, Y. Zou, A. Levine, D. Wang* 9680 - 9684



Synthesis and Photoelectrochemical Study of Vertically Aligned Silicon Nanowire Arrays

Wiring photoelectrodes: Vertically aligned silicon nanowires were chemically synthesized and tested for solar-energy harnessing. Growth experiments reveal that such nanowire arrays can be obtained when the growth is slow. Photoelectrochemical studies validate that silicon nanowires are promising candidates for efficient solar cells.



Protein-Protein Interactions

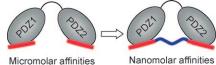
A. Bach, C. N. Chi, G. F. Pang, L. Olsen, A. S. Kristensen, P. Jemth,

K. Strømgaard* _____ 9685 - 9689



Design and Synthesis of Highly Potent and Plasma-Stable Dimeric Inhibitors of the PSD-95-NMDA Receptor Interaction

On the double: Dimerization of monomeric peptide ligands towards the PDZ domains of the protein PSD-95 (postsynaptic density 95) leads to potent inhibitors of protein-protein interactions with stability in blood plasma. Optimization of the length of the polyethylene glycol linker results in unprecedented affinity for inhibitors of the PDZ1-2 domain (see picture).



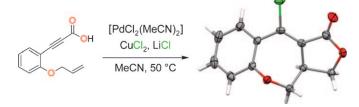
Nanomolar affinities

Cascade Reactions

Y. Li, K. J. Jardine, R. Tan, D. Song,* V. M. Dong* _____ 9690 - 9692



Palladium-Catalyzed Intramolecular Carboesterification of Olefins



One catalyst, three bonds: The title reaction between propiolic acids and unactivated olefins (see scheme; O red, Cl green) results in vicinal functionalization of the olefin, with the formation of

new C-C and C-O bonds. Structurally complex 6,7,5-tricyclic ring systems are formed in a single step by this cascade chloropalladation and formal [3+2] cycloaddition.



Heterocyclic hot pot: Platinum(II)-catalyzed syntheses of indoles and isoquinolines from isocyanates, which are derived from a Hofmann-type rearrangement of amides using a hypervalent iodine

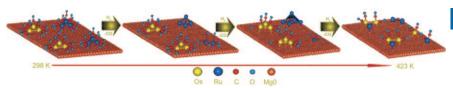
reagent, are described. C2-symmetric macrocyclic bis (indole)s can also be synthesized from transannulation of C2-symmetric macrocyclic bis(alkyne carbamate) intermediates.

Tandem Reactions

N. Okamoto, Y. Miwa, H. Minami, K. Takeda, R. Yanada* ___ **__ 9693 – 9696**

Concise One-Pot Tandem Synthesis of Indoles and Isoquinolines from Amides





Initial steps of bimetallic Ru-Os cluster formation on MgO in the presence of H₂ are analyzed by EXAFS and IR spectroscopy. Ru-Os bond formation takes place after decarbonylation of Ru₃ clusters and subsequently, at higher temperatures, of Os₃ clusters to generate coordinative unsaturation (see scheme).

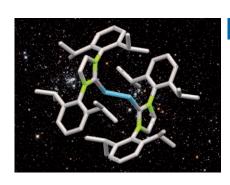
Cluster Formation

A. Kulkarni, B. C. Gates* ___ 9697 - 9700

Spectroscopic Elucidation of First Steps of Supported Bimetallic Cluster Formation



Zero Ge! Reductions of an N-heterocyclic carbene (NHC) adduct of GeCl2 with magnesium(I) dimers afford a dimeric compound (see picture), which structural and theoretical studies show to contain a singlet digermanium(0) fragment :Ge=Ge: datively coordinated by two NHC ligands.



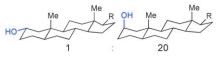
Main-Group Chemistry

A. Sidiropoulos, C. Jones,* A. Stasch,* S. Klein, G. Frenking* _____ 9701 - 9704

N-Heterocyclic Carbene Stabilized Digermanium(0)



Relative reactivity in alcohol oxidation:



Relative reactivity in C-H oxidation:

Angew. Chem. Int. Ed. 2009, 48, 9571-9580

What a relief! In 1955, strain release was put forward as a reactivity factor to explain the differing reactivity of axial and equitorial alcohols during oxidation. The same rationale may account for the differing rates of activation between axial and equitorial C-H bonds in C-H activation processes (see scheme).

Synthetic Methods

K. Chen, A. Eschenmoser,* P. S. Baran* _ 9705 - 9708

Strain Release in C-H Bond Activation?



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Contents

Zinc Complexes

R. C. Neu, E. Otten,
D. W. Stephan* ______ 9709 – 9712



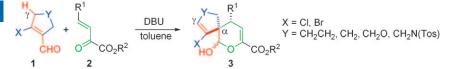
Bridging Binding Modes of Phosphine-Stabilized Nitrous Oxide to $Zn(C_6F_5)_2$



Just say NNO: Reaction of $[tBu_3PN_2O(B-(C_6H_4F)_3)]$ with 1, 1.5, or 2 equivalents of $Zn(C_6F_5)_2$ affords the species $[\{tBu_3PN_2OZn(C_6F_5)_2\}_2]$, $[\{tBu_3PN_2OZn-(C_6F_5)_2\}_2Zn(C_6F_5)_2]$, and $[tBu_3PN_2O\{Zn-(C_6F_5)_2\}_2]$ (see structure; red Zn (large sphere), O (small sphere), green N, yellow P) displaying unique binding modes of Zn to the phosphine-stabilized N_2O fragment.

Tandem Reactions

W. Yao, Y. Wu, G. Wang, Y. Zhang, C. Ma* ______ 9713 – 9716



Tertiary Amine Mediated Tandem Cross-Rauhut-Currier/Acetalization Reactions: Access to Functionalized Spiro-3,4-Dihydropyrans

 γ -Proton transfer furnished the highly selective title reaction in which cyclic β -haloenals 1 react with β , γ -unsaturated α -ketoesters 2 to generate functionalized spiro-3,4-dihydro-2H-pyrans 3 having an

 α -quaternary carbon center and an adjacent vinyl halide group in skeleton. DBU = 1,8-diazabicyclo[5.4.0]undec-7-ene, Tos = 4-toluenesulfonyl.

Directed Ferration

S. H. Wunderlich,
P. Knochel* ______ 9717 – 9720



Preparation of Functionalized Aryl Iron(II) Compounds and a Nickel-Catalyzed Cross-Coupling with Alkyl Halides

$$\begin{array}{c} \text{CO}_2\text{Et} & (\text{tmp})_2\text{Fe-4LiCl-}2\text{MgCl}_2 \\ \text{(0.75 equiv)} & \\ \text{THF, 25 °C, 18 h} & \\ \text{CN} & \\ \end{array}$$

The *ortho*-ferration of functionalized arenes using tmp₂Fe·2 MgCl₂·4 LiCl furnishes the corresponding diorgano Fe^{II} reagents at 25 °C in high yields. These reagents undergo cross-coupling reac-

tions in the presence of 4-fluorostyrene to give various alkylated arenes. It turned out that Ni^{II} impurities present in commercial FeCl₂ (98% pure) catalyzed this alkyl–aryl cross-coupling reaction.

Host-Guest Chemistry

D. Cao,* Y. Kou, J. Liang, Z. Chen, L. Wang, H. Meier* ______ 9721 – 9723

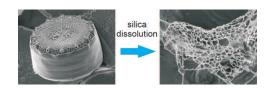
A Facile and Efficient Preparation of Pillararenes and a Pillarquinone

Ring around the roses: The *ipso* substitution of benzene rings makes a simple and efficient synthesis of pillar[n]arenes (n = 5, 6) possible. Pillar[6]arenes (see picture)



and pillar[5]quinone, an oxidation product of pillar[5]arene, are novel, highly promising host systems for host–guest chemistry.





Inner workings: Diatom cell walls are outstanding examples of natural hybrid materials and exhibit interesting mechanical and optical properties. Removal of the biosilicates in the cell

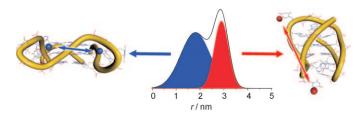
walls of *T. pseudonana* with NH₄F proves that the cell walls contain an internal, organic network consisting of crosslinked chitin fibers as well as other organic components (see picture).

Chitin in Biosilica

E. Brunner,* P. Richthammer, H. Ehrlich, S. Paasch, P. Simon, S. Ueberlein, K.-H. v. Pée ____ _ 9724 - 9727

Chitin-Based Organic Networks: An Integral Part of Cell Wall Biosilica in the Diatom Thalassiosira pseudonana





Distance learning: Under physiological conditions telomeric sequences adopt different quadruplex topologies, although the exact nature of these species is currently debated. Double spin-labeled oligonucleotides consisting of guanosine-

rich telomeric repeats are synthesized and characterized by pulsed EPR techniques. In solution in the presence of K⁺ ions the propeller and basket quadruplex conformations co-exist as a 1:1 mixture.

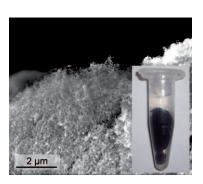
DNA Quadruplexes

V. Singh, M. Azarkh, T. E. Exner, J. S. Hartig,* M. Drescher _ 9728 - 9730

Human Telomeric Quadruplex Conformations Studied by Pulsed EPR



Look, no hands! Non-supported macroscopic aerogels are fabricated from platinum, gold, and silver, and from bimetallic mixtures of gold/silver and platinum/ silver. The hydrogels and aerogels consist of voluminous porous networks of particles or wires that are only a few nanometers thick. These entirely new structures have tremendous potential for applications in catalysis and nanophotonics.



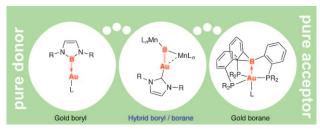
Metal Aerogels

N. C. Bigall, A.-K. Herrmann, M. Vogel, M. Rose, P. Simon, W. Carrillo-Cabrera, D. Dorfs, S. Kaskel, N. Gaponik,

A. Eychmüller* _____ 9731 - 9734

Hydrogels and Aerogels from Noble Metal Nanoparticles





Gold-boron (con)fusion: Addition of an anionic metalloborylene to an [AuCl(Nheterocyclic carbene)] complex results in attack of the boron atom at the gold center and formation of a trimetallic Mn₂AuB framework (see scheme,

middle). X-ray structural analysis and DFT calculations show that the bonding situation of this complex cannot be described by the "boryl" (pure boron donor) or "borane" (pure boron acceptor) descriptions.

Gold-Boron Interactions

H. Braunschweig,* P. Brenner,

R. D. Dewhurst, M. Kaupp,* R. Müller,

S. Östreicher ______ 9735 – 9738

A Trimetallic Gold Boride Complex with a Fluxional Gold-Boron Bond



9579

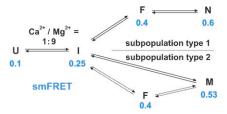
Contents

RNA Folding

M. Steiner, D. Rueda,*
R. K. O. Sigel* ______ 9739 - 9742



Ca²⁺ Induces the Formation of Two Distinct Subpopulations of Group II Intron Molecules New wrinkles in folding: In the folding of the D135 ribozyme derived from the group II intron $Sc.ai5\gamma$, partial replacement of Mg^{2+} with Ca^{2+} leads to a division into two distinct subpopulations that are not interchangeable. The picture shows the splitting into the two types together with the single-molecule FRET states.

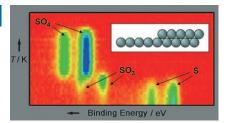


Sulfur Oxidation

R. Streber, C. Papp, M. P. A. Lorenz, A. Bayer, R. Denecke,

H.-P. Steinrück* _____ 9743 – 9746

Sulfur Oxidation on Pt(355): It Is the Steps!



Steps in the right direction: The role of steps in the removal of sulfur from a Pt model catalyst, via metastable SO_3 and SO_4 species, was demonstrated by in situ high-resolution X-ray photoelectron spectroscopy. From isothermal experiments the activation energy of the rate-determining step was deduced to be 34 kJ mol⁻¹.

Single-Molecule Imaging

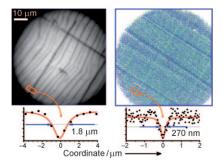
A. V. Naumov,* A. A. Gorshelev, Yu. G. Vainer, L. Kador,

J. Köhler* ______ 9747 – 9750



Far-Field Nanodiagnostics of Solids with Visible Light by Spectrally Selective Imaging

Cracking up: Use of conventional microscopy allows the width of a crack in a crystal to be determined with an accuracy that is limited by classical diffraction (see picture, left-hand image). Single-molecule imaging methods enable the determination of the crack profile with an accuracy beyond the diffraction limit (right-hand image).





Supporting information is available on www.angewandte.org (see article for access details).



A video clip is available as Supporting Information on www.angewandte.org (see article for access details).

Sources

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The issues for November 2009 appeared online on the following dates: Issue 46: October 28 · Issue 47: November 5 · Issue 48: November 11 · Issue 49: November 17