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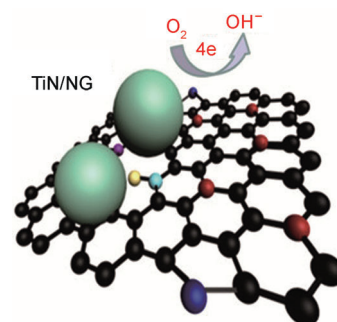


### Oxygen Reduction

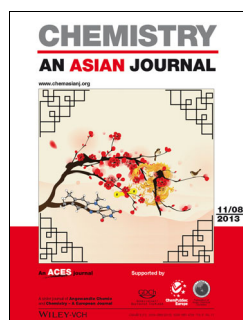
M. Liu, Y. Dong, Y. Wu, H. Feng, J. Li\*

Titanium Nitride Nanocrystals on Nitrogen-Doped Graphene as an Efficient Electrocatalyst for Oxygen Reduction Reaction

**Through a facile synthetic process**, a TiN/NG hybrid can be prepared as an efficient oxygen reduction reaction electrocatalyst in a four-electron pathway (see figure). It is low-cost and widely available and affords strong methanol tolerance and long-term durability. The synergistic chemical coupling effects between TiN and NG should be responsible for the excellent catalytic activity.



*Chem. Eur. J.*  
DOI: 10.1002/chem.201302425

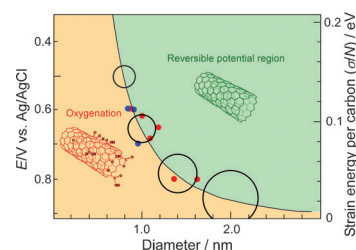


### Electrochemistry

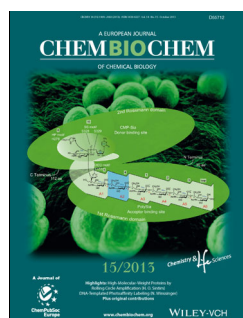
S. Sakamoto, M. Tominaga\*

Determination of the Diameter-Dependent Onset Potential for the Oxygenation of SWCNTs

**Wonderwalls:** The diameter-dependent onset potential for the oxygenation reaction of SWCNTs in neutral aqueous solution was determined by using in situ Raman spectroelectrochemical measurements. The relationship between the electrochemical potential for the oxygenation reaction and the diameter of SWCNTs was characterized.



*Chem. Asian J.*  
DOI: 10.1002/asia.201300716

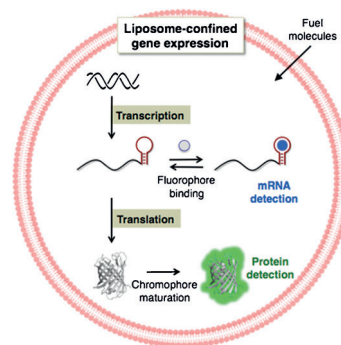


### Artificial Cells

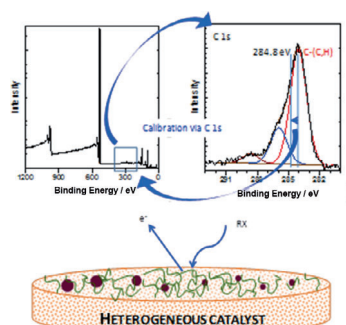
P. van Nies, Z. Nourian, M. Kok, R. van Wijk, J. Moeskops, I. Westerlaken, J. M. Poolman, R. Eelkema, J. H. van Esch, Y. Kuruma, T. Ueda, C. Danelon\*

Unbiased Tracking of the Progression of mRNA and Protein Synthesis in Bulk and in Liposome-Confined Reactions

**Colorful expression:** The dynamics of gene expression in bulk solution and in liposome-confined reactions were analyzed with a two-reporter fluorescence assay by using the Spinach RNA aptamer and its fluorogenic probe for mRNA detection. In contrast to bulk expression, the levels of synthesized mRNA and protein inside lipid vesicles are heterogeneous and uncorrelated.



*ChemBioChem*  
DOI: 10.1002/cbic.201300449



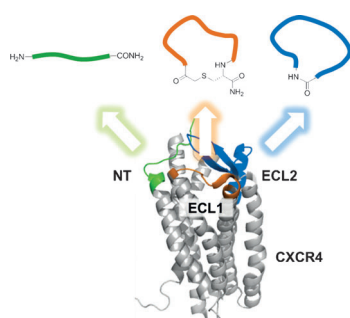
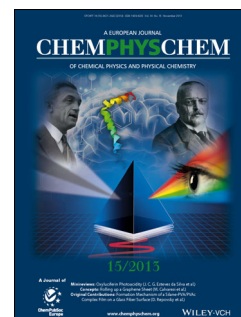
ChemPhysChem  
DOI: 10.1002/cphc.201300411

### X-Ray Spectroscopy

M. Jacquemin, M. J. Genet, E. M. Gaigneaux, D. P. Debecker\*

Calibration of the X-Ray Photoelectron Spectroscopy Binding Energy Scale for the Characterization of Heterogeneous Catalysts: Is Everything Really under Control?

**Taking control:** X-ray photoelectron spectroscopy (XPS) analysis of heterogeneous catalysts usually relies on binding energy scale calibration by using the C 1s peak as an internal standard. The inorganic solid can, however, have a marked impact on the photoelectron emitted from the adventitious carbon, and this creates an important calibration bias that must be taken into account and corrected for proper use of XPS data.



ChemMedChem  
DOI: 10.1002/cmdc.201300289

### Antiviral Agents

C. Hashimoto, W. Nomura, T. Narumi, M. Fujino, H. Tsutsumi, M. Haseyama, N. Yamamoto, T. Murakami, H. Tamamura\*

Anti-HIV-1 Peptide Derivatives Based on the HIV-1 Co-receptor CXCR4

**Several peptide derivatives** of CXCR4 extracellular domains were synthesized and evaluated for anti-HIV-1 activity. The 39-mer N-terminal region (NT) was divided into three fragments with 10-mer overlapping sites, and these linear peptides were synthesized. The peptide containing Met1–Asp20 shows significant anti-HIV-1 activity. Extracellular loops 1 and 2 (ECL1 and 2) were mimicked by cyclic peptides, synthesized by chemoselective cyclization. Both show higher anti-HIV-1 activity than their linear counterparts. These results show that Met1–Asp20 on the NT and cyclic peptides of ECL1 and ECL2 are potent anti-HIV-1 drug candidates.



ChemSusChem  
DOI: 10.1002/cssc.201300554

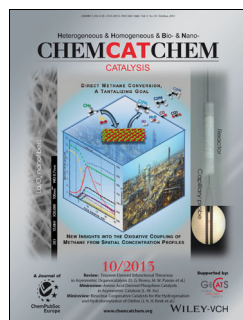
### Renewables

A. Negoi, I. T. Trotus, O. Mamula Steiner,\* M. Tudorache, V. Kuncser, D. Macovei, V. I. Parvulescu,\* S. M. Coman\*

Direct Synthesis of Sorbitol and Glycerol from Cellulose over Ionic Ru/Magnetite Nanoparticles in the Absence of External Hydrogen

**A sweet catalyst:** A catalyst formed of Ru/functionalized silica-coated magnetite nanoparticles is highly efficient in the one-pot production of sorbitol and glycerol, starting from cellulose and in the absence of an external hydrogen source. The ease of recoverability of the catalyst from the solid residues, and its reuse without loss of activity or selectivity for several runs, is an important green element of the process.



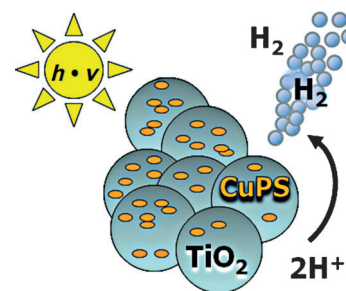


## Photocatalysis

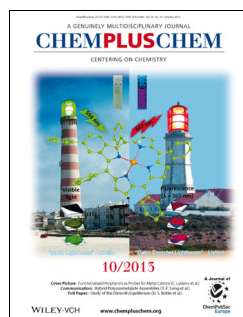
M. Karnahl, E. Mejía, N. Rockstroh, S. Tschierlei, S.-P. Luo, K. Grabow, A. Kruth, V. Brüser, H. Junge, S. Lochbrunner, M. Beller\*

Photocatalytic Hydrogen Production with Copper Photosensitizer–Titanium Dioxide Composites

**With Copper We Can:** This report is about novel devices for the photocatalytic reduction of protons based on a fully noble metal free system. New copper photosensitizers (CuPS) containing sulfonate anchor groups were prepared and sensitized on TiO<sub>2</sub>. The resulting CuPS-TiO<sub>2</sub>-composites exhibit a strong absorption in visible light with turnover numbers above 2300.



ChemCatChem  
DOI: 10.1002/cctc.201300459

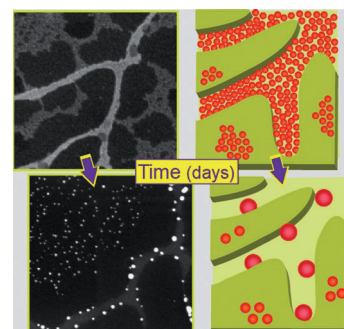


## Surface Chemistry

M. J. Pavan, R. Shenhar\*

Effect of Channel Confinement on the Coarsening Kinetics of Nanoparticles Deposited on Semicrystalline Polymer Templates

**Confined spaces:** Gold nanoparticles coarsen within days under ambient conditions when placed on a poly(ethylene glycol) template (see picture). Nanoparticles located inside the channels reach larger sizes than those on the plateaus of the template. Confinement and probably also the difference in the mechanical properties of the polymer in these regions of the template are responsible for this behavior.



ChemPlusChem  
DOI: 10.1002/cplu.201300144

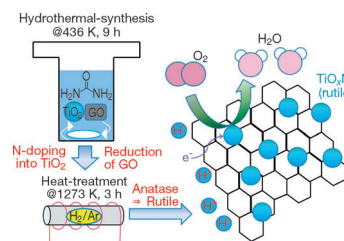


## Electrocatalysis

M. Chisaka,\* H. Muramoto

Reduced Graphene-Oxide-Supported Titanium Oxynitride as Oxygen Reduction Reaction Catalyst in Acid Media

**Inexpensive catalysts:** A facile synthetic route to titanium oxynitride catalysts supported on reduced graphene-oxide sheets is developed for use in polymer electrolyte fuel cell cathodes.



ChemElectroChem  
DOI: 10.1002/celec.201300058

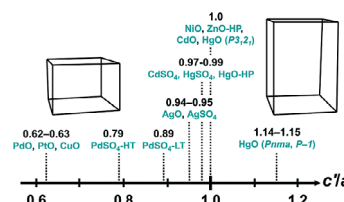


## Metal Oxides and Sulfates

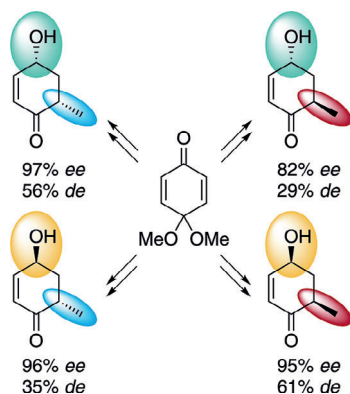
M. Derzsi,\* A. Hermann, R. Hoffmann, W. Grochala

The Close Relationships between the Crystal Structures of MO and MSO<sub>4</sub> (M = Group 10, 11, or 12 Metal), and the Predicted Structures of AuO and PtSO<sub>4</sub>

The structural relations of (and between) late transition metal monoxides, MO, and monosulfates, MSO<sub>4</sub>, are analyzed. We show that all of these late transition metal oxides, as well as 4d and 5d metal sulfates, crystallize in distorted rock salt lattices and argue that the distortions are driven by collective first- and/or second order Jahn–Teller effects, as quantified by the *c'*/*a'* ratio.



Eur. J. Inorg. Chem.  
DOI: 10.1002/ejic.201300769



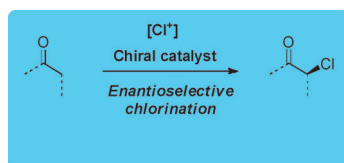
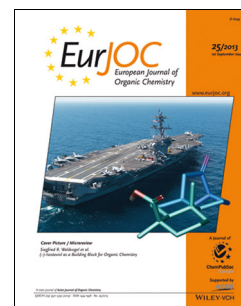
*Eur. J. Org. Chem.*  
DOI: 10.1002/ejoc.201300752

### Natural Product Synthesis

A. C. Meister, P. F. Sauter, S. Bräse\*

#### A Stereoselective Approach to Functionalized Cyclohexenones

A stereoselective approach to the natural product building block 4-hydroxy-6-methylcyclohex-2-en-1-one is presented herein. Four different isomers were obtained with excellent enantiomeric excess values and good diastereoselectivities through a two-step process that started from 4,4-dimethoxycyclohexa-2,5-dien-1-one. This represents the shortest synthetic approach to these molecules.



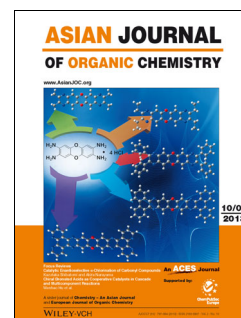
*Asian J. Org. Chem.*  
DOI: 10.1002/ajoc.201300058

### $\alpha$ -Chlorination of Carbonyl Compounds

K. Shibatomi,\* A. Narayama

#### Catalytic Enantioselective $\alpha$ -Chlorination of Carbonyl Compounds

**Being the alpha:** Despite the synthetic utility of chiral alkyl chlorides, catalytic methods for achieving enantioselective chlorination were only developed a decade ago. This Focus Review discusses the catalytic enantioselective  $\alpha$ -chlorination of carbonyl compounds, as well as some stereospecific substitution reactions of the resulting optically active chlorides.



*ChemViews magazine*  
DOI: 10.1002/chemv.201300085

### Nuclear Energy

#### Nuclear Power Stations

In 1954, at Obninsk, Russia, the first nuclear power station was connected to the power grid with a net output of 5 MW. Now, there are 437 nuclear power plants in 31 countries, with a capacity of over 372 GW. ChemViews magazine gives a summary the number of nuclear power plants in various countries and looks at the nuclear energy capacity of the top five producers.

