



## Swiss Science Concentrates

A CHIMIA Column

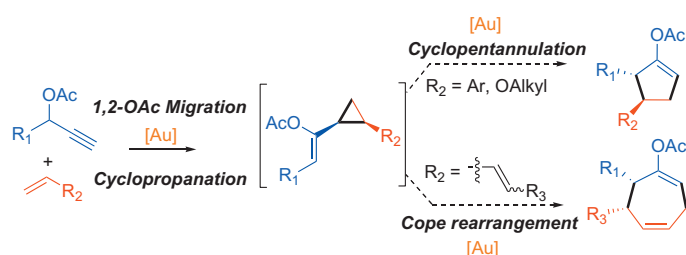
Short Abstracts of Interesting Recent Publications of Swiss Origin

### Gold-Catalyzed Cyclopenta- and Cycloheptannulation Cascades: A Stereocontrolled Approach to the Scaffold of Frondosins A and B

D. Garayalde, K. Krüger, and C. Nevado\*, *Angew. Chem. Int. Ed.* **2011**, 50, 911.

University of Zurich.

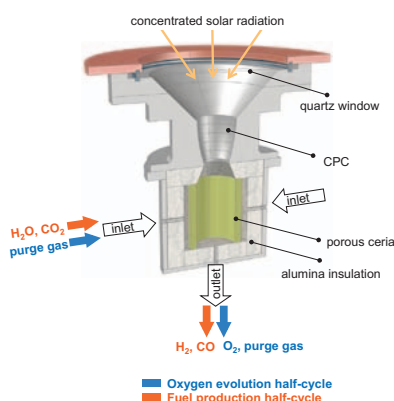
The authors report two highly diastereoselective, gold-catalyzed, three-step cascade processes for the synthesis of highly substituted five- and seven-membered rings from propargyl acetates and alkenes or 1,3-dienes, respectively. The cyclo-heptannulation reaction represents an attractive alternative to previously reported rhodium catalyzed reactions. The concerted nature of the process has allowed an alternative, formal enantioselective synthesis of the marine secondary metabolites frondosin A and B.



### High-Flux Solar-Driven Thermochemical Dissociation of CO<sub>2</sub> and H<sub>2</sub>O Using Nonstoichiometric Ceria

W. C. Chueh, C. Falter, M. Abbott, D. Scipio, P. Furler, S. M. Haile,\* and A. Steinfeld\*, *Science* **2010**, 330, 1797  
ETH Zürich, Paul Scherrer Institute and Caltech (USA).

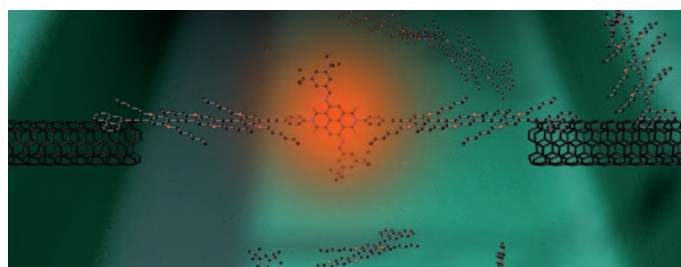
The effective application of concentrated solar energy to produce transportable and dispatchable chemical fuels may ensure the goal of a sustainable energy future. By using a solar cavity-receiver reactor, the authors combined the oxygen uptake and release capacity of CeO<sub>2</sub> and facile catalysis at elevated temperatures to thermochemically dissociate CO<sub>2</sub> and H<sub>2</sub>O, yielding CO and H<sub>2</sub>, respectively. Stable and rapid generation of fuel was demonstrated over 500 cycles.



### Electroluminescence from a Single Nanotube-Molecule-Nanotube Junction

C. W. Marquardt, S. Grunder, A. Błaszczuk, S. Dehm, F. Hennrich, H. v. Löhneysen, M. Mayor\* and R. Krupke\*, *Nat. Nanotechnol.* **2010**, 5, 863

Karlsruhe Institute of Technology (D), DFG Center for Functional Nanostructures (D) and Universities of Basel and Poznan (P). With molecular electronics applications in mind, the positioning of a single molecule between two electrodes has attracted much attention in recent years. Although electrical transport through single molecules was observed as early as 1997, the authors report for the first time electroluminescence through a rod-like molecule between to metallic single-walled carbon nanotube electrodes.

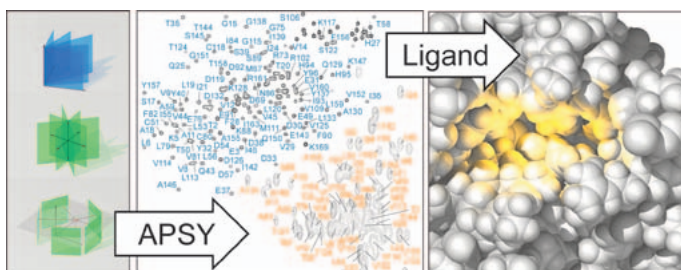


### Automated NMR Resonance Assignment of Large Proteins for Protein-Ligand Interaction Studies

A. D. Gossert, S. Hiller, and C. Fernández\*, *J. Am. Chem. Soc.* **2011**, 133, 210.

Novartis Institutes for Biomedical Research and Biozentrum, University of Basel

The NMR analysis of protein-ligand interactions at atomic resolution remains a challenging and time-intensive task due to the required sequence-specific resonance assignment of the protein. A major improvement in this respect has been achieved in the past by applying automated projection spectroscopy (APSY). A new robust and highly automated procedure, that relies on the combination of three APSY experiments including the new 4D APSY-HNCACB and the use of fractionally deuterated protein samples, doubles the size limit of APSY-based assignments to 25 kDa. The method has been successfully applied in the determination of protein-ligand interactions with impressively low time expenditure.



Prepared by N. Bruns, V. Köhler, R. Kramer, P. Mauleón, F. Monnard and T. R. Ward

Do you want your article to appear in this SWISS SCIENCE CONCENTRATES highlight?

Please contact thomas.ward@unibas.ch