



Swiss Science Concentrates

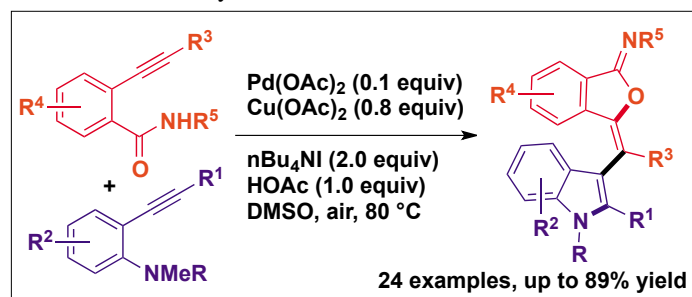
A CHIMIA Column

Short Abstracts of Interesting Recent Publications of Swiss Origin

Palladium(II)-Catalyzed Cyclizative Cross-Coupling of *ortho*-Alkynylanilines with *ortho*-Alkynylbenzamides under Aerobic Conditions

B. Yao, Q. Wang, J. Zhu*, *Angew. Chem. Int. Ed.* **2013**, *52*, 12992. EPF Lausanne

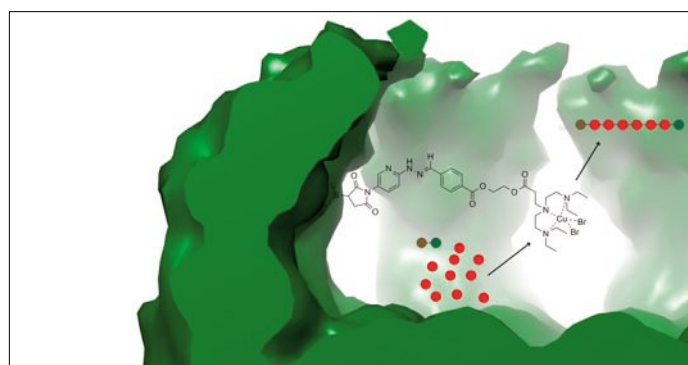
The synthesis of heterocycles from readily available starting materials is an attractive challenge. Zhu and co-workers report on a Pd(II)-mediated cyclizative cross-coupling approach to form bis-heterocycles from two different nucleophile-bearing internal alkynes. In this operationally simple reaction, three chemical bonds are formed and are tethered by a tetrasubstituted olefin. Homodimer formation is minimized by adding an iodide source. This operationally simple and versatile method can be extended to other bis-heterocyclic motifs.



A Chaperonin as Protein Nanoreactor for Atom-Transfer Radical Polymerization

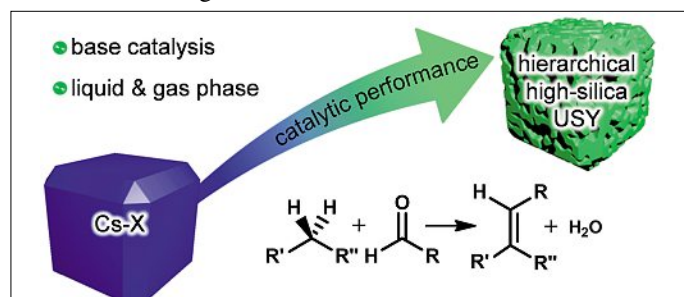
K. Renggli, M. G. Nussbaumer, R. Urbani, T. Pfohl, N. Bruns*, *Angew. Chem. Int. Ed.* **2013**, *52*, 1. Universities of Fribourg and Basel

Atom-transfer radical polymerization (ATRP) is one of the most versatile and efficient radical polymerization that enables exquisite control of polydispersity. Performing ATRP in confined space is expected to further increase the degree of control. The authors exploited a protein nanoreactor (a thermosome) that both compartmentalizes the catalyst and monomers and extrudes the synthesized polymer with narrow molecular weight distribution. In addition, polymerization inside protein nonreactors represent the ideal system to study ATRP on a single-molecule level.



Hierarchical High-Silica Zeolites as Superior Base Catalysts

T. C. Keller, S. Isabettoni, D. Verboekend, E. G. Rodrigues, J. Pérez-Ramírez*, *Chem. Sci.* **2014**, *5*, 677. ETH Zürich
Zeolites find very broad applications as heterogeneous catalysts in industry. For some applications however, their production costs or low stability may be prohibitive. Pérez-Ramírez and coworkers report a new type of high-silica zeolites with hierarchical porosity. These structures outperform their classical aluminum-rich counterparts in base-catalyzed aldol and Knoevenagel condensations. For the self-condensation of propanal, the authors demonstrate the increased stability of their new constructs compared to other heterogeneous catalysts including caesium-rich zeolites or MgO.



Closer to Photosystem II: A Co₄O₄ Cubane Catalyst with Flexible Ligand Architecture

F. Evangelisti, R. Güttinger, R. Moré, S. Luber, G. R. Patzke*, *J. Am. Chem. Soc.* **2013**, *135*, 18734. University of Zurich
In the water splitting challenge, cheap and robust water oxidation catalysts (WOC) remain elusive. In this context, Patzke *et al.* present an innovative and functional mimic of the natural oxygen evolving complex. It consists of a cubane-type cobalt cluster with Co(II) centers in high-spin states. This system catalyzes the visible-light-driven oxidation of water to dioxygen. In a biomimetic spirit, the catalyst bears modular aqua and acetate ligands, resulting in structural flexibility through ligand exchange processes, while maintaining the stable tetranuclear core structure. This inspiring WOC thus paves the way to highly tunable PS II mimics.

