



Swiss Science Concentrates

A CHIMIA Column

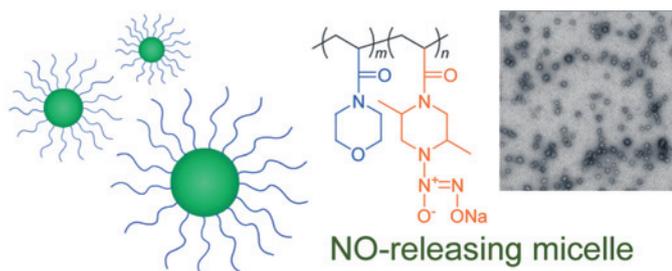
Short Abstracts of Interesting Recent Publications of Swiss Origin

Micelles for Delivery of Nitric Oxide

Y. S. Jo, A. J. van der Vlies, J. Gantz, T. N. Thacher, S. Antonijevic, S. Cavadini, D. Demurtas, N. Stergiopoulos, and J.A. Hubbell* *J. Am. Chem. Soc.* **2009**, *131*, 14413

EPF Lausanne, University of California, and University of Lausanne.

In this paper, block copolymer pro-amphiphiles and amphiphiles were designed to provide very long-term release of nitric oxide (NO). A block copolymer of *N*-acryloylmorpholine (AM, as a hydrophile) was synthesized in particular. The PAM block guides the aggregation toward micellization, rather than precipitation, yielding *ca.* 50 nm spherical micelles. The hydrophobic core of the micelle delays release of NO to a remarkable 7 d half-life. Release of the NO resulted in the retention of the original soluble polymer. The very small NO-loaded micelles were able to penetrate complex tissue structures, such as the arterial media, opening up a number of tissue targets to NO-based therapy.

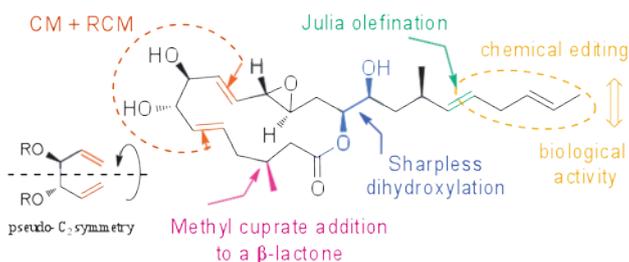


Syntheses and Biological Evaluation of Iriomoteolide and Analogues

R. Cribiú, C. Jäger, and C. Nevado* *Angew. Chem. Int. Ed.* **2009**, *48*, 8780

University of Zurich

Amphidinium species are an extremely prolific source of marine secondary metabolites, including a rare cytotoxic 15-membered macrolide, iriomoteolide. Its stereocontrolled synthesis was accomplished by the authors through a combined cross-metathesis (CM)/ring-closing metathesis (RCM) approach. Further chemical editing of the molecule provided non-natural analogues, which have comparable anticancer activity to that of the natural product, thereby allowing the iriomoteolides to be used as probe molecules in chemical biology.

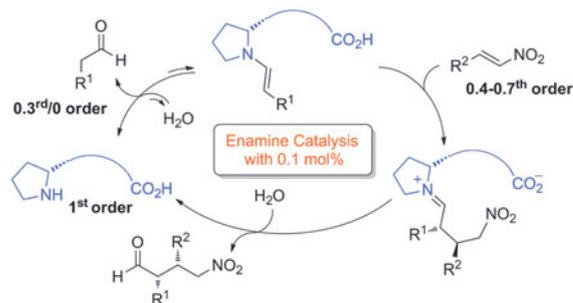


Enamine Catalysis with Low Catalyst Loadings – High Efficiency via Kinetic Studies

M. Wiesner, G. Upert, G. Angelici, and H. Wennemers* *J. Am. Chem. Soc.*, **2009**, DOI 10.1021/ja9068112

University of Basel

In this paper, the authors describe how kinetics studies can provide a deep insight into the catalytic cycle of peptide-catalyzed conjugate addition reactions between aldehydes and nitroolefins. It was demonstrated that the rate determining step is not the enamine formation but both the C–C bond formation step and the hydrolysis of the iminium ion. This study enabled an optimization of the reaction conditions and more remarkably to reduce the catalyst loading to 0.1 mol% for a broad range of substrates, something that had never been achieved so far in enamine catalysis.



Rapid Characterization of Complex Viscous Liquids at the Molecular Level

W. S. Law, H. Chen,* J. Ding, S. Yang, L. Zhu, G. Gamez, K. Chingin, Y. Ren, and R. Zenobi* *Angew. Chem. Int. Ed.* **2009**, *121*, 8427

East China Institute of Technology, Jilin University, and ETH Zürich

This article describes a simple yet universal method to directly analyze complex liquid samples of high viscosity. A N₂ stream forms bubbles inside bulk viscous liquids, which create an aerosol sample through a microjetting mechanism. This aerosol is then analyzed by extractive electrospray ionization (EESI) mass spectrometry (MS). EESI-MS reveals the molecular composition of the complex liquids and the kinetics of ongoing processes occurring in the highly viscous liquids without any pretreatment.

