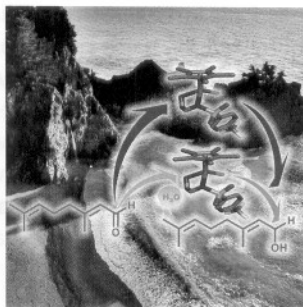


COVER PICTURE



The cover picture shows a reaction scheme for the iridium-catalyzed chemoselective reduction of aldehydes in water, set against a background of clear waters on an unspoiled beach. Catalysis in water is attracting increasing attention in response to calls for environmentally benign and efficient chemical processes. In their Communication on page 71 ff., J. Xiao et al. describe how Ir-*N*-tosyldiamine complexes, previously shown to be excellent catalysts for the transfer hydrogenation of aldehydes in water, also catalyze the reduction of a wide range of aldehydes, including aromatic, aliphatic, heterocyclic, and α,β -unsaturated aldehydes, in water. The hydrogenation reaction is efficient and chemoselective and proceeds without the need for added organic co-solvents, thus providing an atom-economic and environmentally benign means for aldehyde reduction.

NEWS

Spotlights on our sister journals

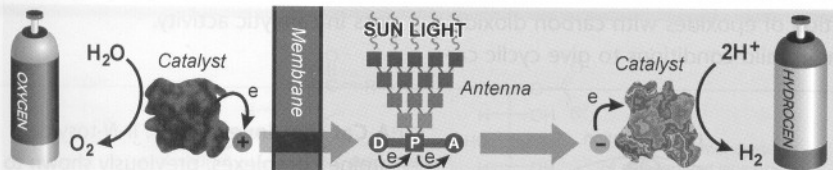
16–17

EDITORIAL BOARD

Members of the Editorial Board

18–20

REVIEWS



V. Balzani,* A. Credi, M. Venturi

26–58

Photochemical Conversion of Solar Energy

A leaf out of nature's book: Will photochemists succeed in their grand challenge to find an artificial means for converting sunlight into fuels? Energy is the most important issue of the 21st century. There is a need to find alterna-

tive energy sources to fossil fuels. The most promising choice is solar energy. Chemists, by creating new materials and new processes, can play a key role in solving the energy crisis.

ESSAYS

Sustainability in action: The European Technology Platform for Sustainable Chemistry (SusChem) is a significant focus for sustainable chemical research and innovation in Europe. It offers a unique opportunity to channel research funding into promising areas (particularly, industrial biotechnology, materials technology, and reaction & process design) that can achieve the goals of increased competitiveness and sustainability.



M. Mours*

59–62

SusChem: From Vision to Action

A. Albini,* M. Fagnoni

63–66

1908: Giacomo Ciamician and the Concept of Green Chemistry



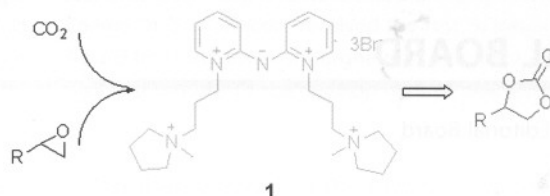
Giving the “green” light: In a lecture held before the Société Française de Chimie in Paris in 1908, Giacomo Ciamician contrasted the harsh conditions of chemical synthesis in the laboratory with the mild syntheses carried out by green plants. Ciamician’s research, with its focus on photochemical reactions, revealed already 100 years ago several of the tenets of contemporary sustainable/green chemistry.

COMMUNICATIONS

W.-L. Wong, P.-H. Chan, Z.-Y. Zhou, K.-H. Lee, K.-C. Cheung, K.-Y. Wong*

67–70

A Robust Ionic Liquid as Reaction Medium and Efficient Organocatalyst for Carbon Dioxide Fixation



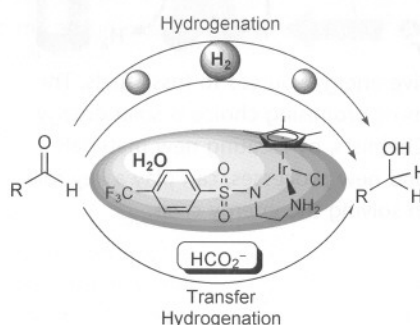
A quick fix of CO₂: Ionic liquid **1** functions both as efficient organocatalyst and reaction medium in the addition reaction of epoxides with carbon dioxide under mild conditions to give cyclic car-

bonates. The new ionic liquid is robust and can be recycled and reused continuously without showing any significant loss in catalytic activity.

X. Wu, C. Corcoran, S. Yang, J. Xiao*

71–74

A Versatile Iridium Catalyst for Aldehyde Reduction in Water

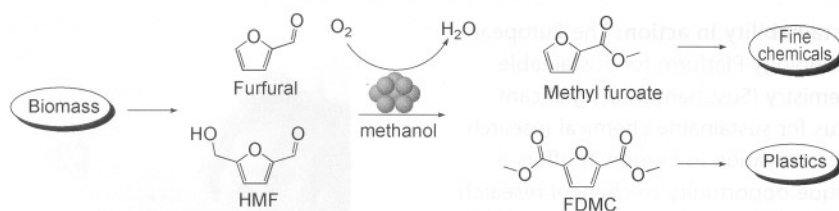


A Cat that loves water: Ir-*N*-tosylid-amine complexes, previously shown to be excellent catalysts for the transfer hydrogenation of aldehydes in water, also catalyze the hydrogenation of aldehydes in water. The reaction is fast and chemoselective, providing a green and efficient method for the reduction of aromatic, aliphatic, heterocyclic, and α,β -unsaturated aldehydes.

E. Taarning, I. S. Nielsen, K. Egeblad, R. Madsen, C. H. Christensen*

75–78

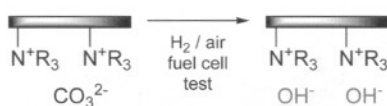
Chemicals from Renewables: Aerobic Oxidation of Furfural and Hydroxymethylfurfural over Gold Catalysts



Aerobic exercise: The biomass-derived platform chemicals furfural and hydroxymethylfurfural (HMF) are readily oxidized in methanol in the presence of oxygen and a supported gold nanoparticle catalyst to afford the correspond-

ing methyl esters (see scheme). Thus, furfural was oxidized to methyl furoate under very mild conditions, and HMF was converted into furan-2,5-dimethylcarboxylate (FDMC), a potential polymer building block, with high yields.

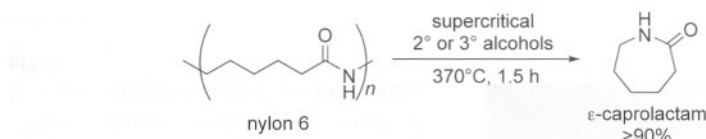
Fuelling the discussion: A carbonate-form metal-cation-free alkaline membrane was evaluated in a fuel cell, and, contrary to prior wisdom, the carbonate content of the membranes was found to decrease. Surprisingly, the power performance was higher relative to tests with the equivalent hydroxide-form membranes.



L. A. Adams, S. D. Poynton, C. Tamain, R. C. T. Slade, J. R. Varcoe*

79–81

A Carbon Dioxide Tolerant Aqueous-Electrolyte-Free Anion-Exchange Membrane Alkaline Fuel Cell



Towards sustainable stockings?

Nylon 6 was efficiently converted into its monomer caprolactam, which was isolated in over 90% yield with excellent purity as the sole product of the

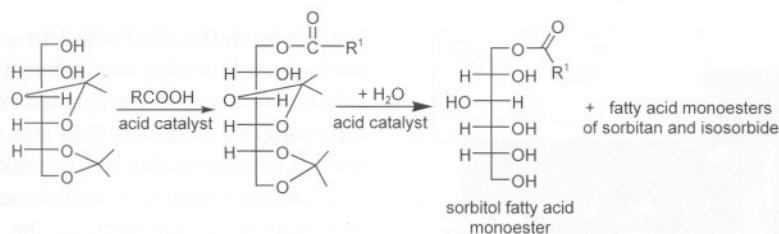
reaction, by treatment with supercritical secondary or tertiary alcohols. The present method opens up a new avenue in plastic recycling chemistry.

A. Kamimura,* Y. Oishi, K. Kaiso, T. Sugimoto, K. Kashiwagi

82–84

Supercritical Secondary Alcohols as Useful Media To Convert Polyamide into Monomeric Lactams

FULL PAPERS



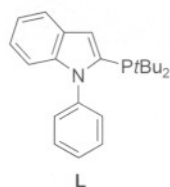
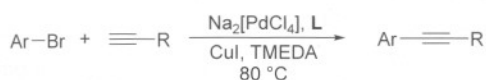
A cascade of sorbitol: Surfactants can be synthesized from renewable raw materials through a two-step cascade reaction using heterogeneous acid catalysts. The process involves the acetalization of

sorbitol with acetone followed by esterification with a fatty acid (oleic acid), with the hydrolysis of the ketal and esterification steps catalyzed by the solid acid.

A. Corma,* S. B. A. Hamid, S. Iborra, A. Velty

85–90

Surfactants from Biomass: A Two-Step Cascade Reaction for the Synthesis of Sorbitol Fatty Acid Esters Using Solid Acid Catalysts



The usual sus-pects: Sonogashira coupling reactions of aryl and heteroaryl halides (derived from furan, thiophene, indole, or pyrimidine) with alkynes have been systematically studied under palladium catalysis. A catalyst system com-

prising sodium tetrachloropalladate and 2-(di-*tert*-butylphosphino)-*N*-aryldole (L) offers high chemoselectivity and good functional group tolerance (TMEDA = tetramethylethylenediamine).


C. Torborg, A. Zapf, M. Beller*

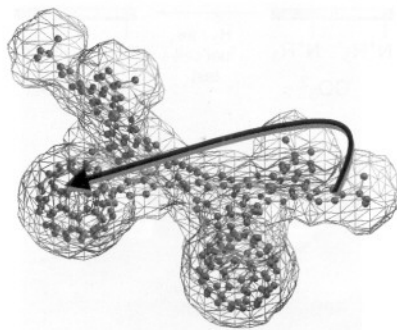
91–96

Palladium Catalysts for Highly Selective Sonogashira Reactions of Aryl and Heteroaryl Bromides

A. Kahnt, M. Quintiliani, P. Vázquez,
D. M. Guldi,* T. Torres*

97–102

 **A Bis(C₆₀)-Bis(phthalocyanine) Nanoconjugate: Synthesis and Photoinduced Charge Transfer**

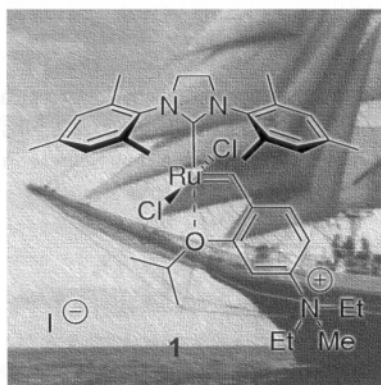


Communicating through space: Intra-molecular electron transfer from the photoexcited zinc-phthalocyanine (ZnPc) moieties to the electron-accepting C₆₀ units governs the overall photo-reactivity of a (ZnPc)₂-(C₆₀)₂ tetrad. Through-space charge-transfer interactions facilitated by the proximity of the electro- and photoactive ZnPc and C₆₀ units influence the lifetimes of the charge-separated state (10⁻¹⁰–10⁻⁹ s).

Ł. Gułajski, A. Michrowska, J. Narożnik,
Z. Kaczmarska, L. Rupnicki, K. Grela*

103–109

A Highly Active Aqueous Olefin Metathesis Catalyst Bearing a Quaternary Ammonium Group

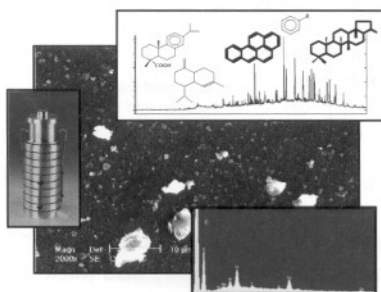


Moving on to greener waters: The presence of the electron-withdrawing quaternary ammonium group in Ru complex **1** not only activates the olefin metathesis catalyst electronically but at the same time makes the catalyst more hydrophilic. Catalyst **1** can therefore be efficiently used in traditional media, such as dichloromethane and toluene, as well as in technical-grade alcohols, alcohol-water mixtures, and in neat water.

A. D. Tullio, S. Reale, M. Ciammola,
L. Arrizza, P. Picozzi, F. De Angelis*

110–117

 **Characterization of Atmospheric Particulate: Relationship between Chemical Composition, Size, and Emission Source**

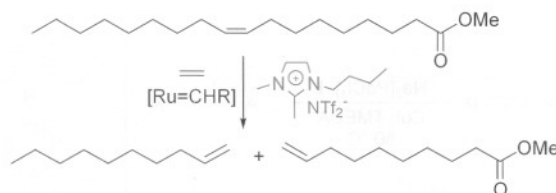


Something in the air: Particulate matter from four sites with different pollution levels, each fractionated into eight samples by size (10–0.43 μm), was characterized according to its component organic compounds and elemental composition. The fine fractions, the most dangerous to human health, are mainly carbonaceous and contain up to 200 organic compounds, including polycyclic aromatic hydrocarbons.

C. Thurier, C. Fischmeister, C. Bruneau,
H. Olivier-Bourbigou,* P. H. Dixneuf*

118–122

Ethenolysis of Methyl Oleate in Room-Temperature Ionic Liquids



Oil rush: The selective cleavage of unsaturated fatty esters from vegetable oils, a renewable feedstock, is an important transformation. The ethenolysis of methyl oleate was performed efficiently in room-temperature ionic liquids with

the first-generation Hoveyda ruthenium catalyst to afford 1-decene and methyl 9-decenoate, useful intermediates for the production of lubricants and polyesters. Moreover, the catalyst could be recycled.

To be or not to be ...? Is microwave chemistry green? A critical analysis of different reactions performed under conventional and microwave heating demonstrates that microwave dielectric heating may not be as energy-efficient as generally assumed, in particular when comparing open-vessel reflux processing.



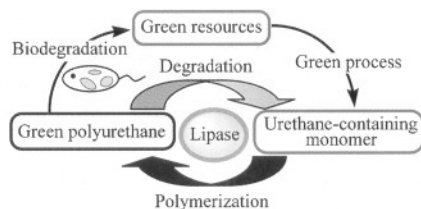
T. Razaq, C. O. Kappe*

123 – 132

On the Energy Efficiency of Microwave-Assisted Organic Reactions



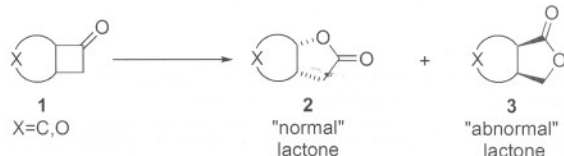
Plastic fantastic: Novel poly(ester-urethane)s that display both excellent chemical recyclability and biodegradability properties were prepared by the enzymatic polymerization of urethane-containing monomers. The polyurethanes thus produced were readily degradable in the presence of lipase to give oligomers that could be recycled to regenerate the parent polymer.



Y. Yanagishita, M. Kato, K. Toshima, S. Matsumura*

133 – 142

Chemoenzymatic Synthesis and Chemical Recycling of Sustainable Polyurethanes



Bio-certified products: Enzyme-mediated Baeyer–Villiger (BV) oxidation of racemic fused ketones **1** leads to the formation of regiodivergent “normal” lactones **2** and “abnormal” lactones **3** with high enantiopurities depending on the

BV monooxygenase used. The study was carried out using a collection of monooxygenases in a whole-cell system with recombinant *Escherichia coli* as the host organism.

M. D. Mihovilovic,* P. Kapitán, P. Kapitánová

143 – 148

Regiodivergent Baeyer–Villiger Oxidation of Fused Ketones by Recombinant Whole-Cell Biocatalysts

No lightweight when it comes to strength: Highly porous and strong cellulose hydrogels are obtained by dissolution of cellulose in aqueous alkali-urea solution followed by regeneration from various solvents. Drying the hydrogels gives rise to cellulose aerogels (see photo, right) which may be useful, for example, as catalyst supports.



J. Cai,* S. Kimura, M. Wada, S. Kuga,* L. Zhang

149 – 154

Cellulose Aerogels from Aqueous Alkali Hydroxide–Urea Solution

Supporting information on the WWW (see article for access details).

A video clip is available as Supporting Information on the WWW (see article for access details).

* Author to whom correspondence should be addressed.

SERVICE

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<http://www.chemsuschem.org>

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