



Full text:



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## COVER PICTURE



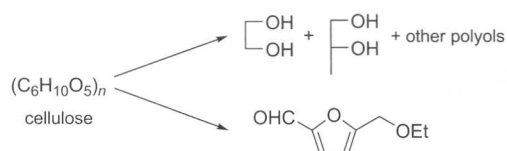
The cover picture shows the membrane separation of water (blue arrow) from crude ethanol (red arrows) as a key enabling technology in the production of ethanol from lignocellulosic biomass. This technology is generally considered to be one of the more viable options for the transition to a sustainable transportation fuel supply. In their Communication on page 158, J. F. Vente and co-workers describe the preparation and performance of an amorphous bridged silsesquioxane-based membrane characterized by Si-CH<sub>2</sub>-Si building units. This new organic-inorganic hybrid silica membrane allows the dehydration of ethanol and, to some extent, methanol. Even the presence of 1.5 wt % acetic acid does not affect the separation performance of these membranes.

## NEWS

Spotlights on our sister journals

124 – 125

## HIGHLIGHTS



**Steering away from alcohol:** Fermentation of carbohydrates to ethanol might not be the best way to utilize biomass for the production of fuels and platform

chemicals. Two different new remarkable approaches lead to polyols or furfural derivatives.

M. Rüschen, K. Klaas,\* H. Schöne

127 – 128

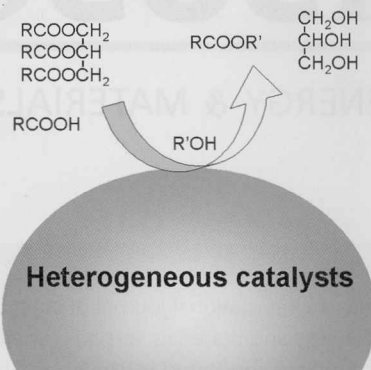
**Direct, High-Yield Conversions of Cellulose into Biofuel and Platform Chemicals—On the Way to a Sustainable Biobased Economy**

## MINIREVIEWS

M. Hara\*

129–135

## Environmentally Benign Production of Biodiesel Using Heterogeneous Catalysts

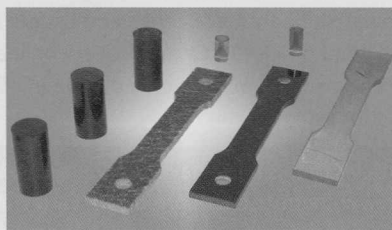


**Fuelling the future:** The production of esters of higher fatty acids from plant materials is of great interest for the manufacture of biodiesel. Heterogeneous catalysts can provide new routes for the environmentally benign production of biodiesel. Particulate heterogeneous catalysts can be readily separated from products following reaction allowing the catalyst to be reused, generating less waste, and consuming less energy.

Y. Lu, R. C. Larock\*

136–147

## Novel Polymeric Materials from Vegetable Oils and Vinyl Monomers: Preparation, Properties, and Applications



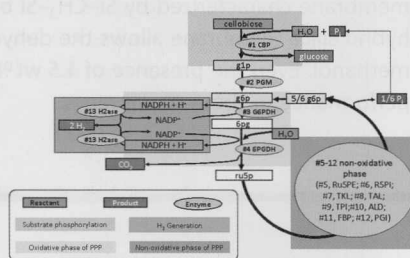
**Veggie-based products:** Vegetable-oil-based polymeric materials, prepared by free radical, cationic, and olefin metathesis polymerizations, range from soft rubbers to ductile or rigid plastics, and to high-performance biocomposites and nanocomposites. They display a wide range of thermophysical and mechanical properties and may find promising applications as alternatives to petroleum-based polymers.

## COMMUNICATIONS

X. Ye, Y. Wang, R. C. Hopkins,  
M. W. W. Adams, B. R. Evans, J. R. Mielenz,  
Y.-H. P. Zhang\*

149–152

## Spontaneous High-Yield Production of Hydrogen from Cellulosic Materials and Water Catalyzed by Enzyme Cocktails

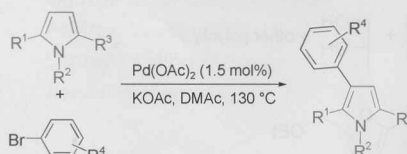


**Cocktail reception:** Biohydrogen is produced in high yield from cellulosic materials and water in a one-pot process catalyzed by up to 14 enzymes and one coenzyme. This assembly of enzymes results in non-natural catabolic pathways. These spontaneous reactions are conducted under modest reaction conditions (32 °C and atmospheric pressure).

Y. Fall, H. Doucet,\* M. Santelli\*

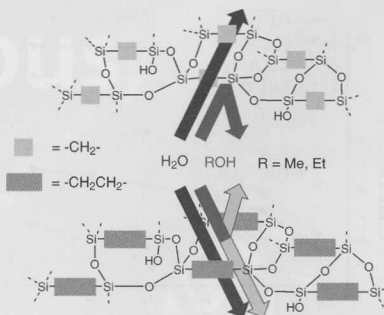
153–157

## Palladium-Catalysed Direct 3- or 4-Arylation of 2,5-Disubstituted Pyrrole Derivatives: An Economically and Environmentally Attractive Procedure



**Straight to the point:** The direct 3- or 4-arylation of pyrrole derivatives through C–H bond activation proceeds in moderate to good yields using Pd(OAc)<sub>2</sub> as catalyst. In contrast to classical coupling procedures, the preparation of an organometallic derivative is not required and the major by-products are AcOH/KBr instead of metallic salts.

**A thirst for water:** Organic–inorganic hybrid silica nanosieve membranes with narrow pore size distributions were developed for the separation of binary (bio)alcohol/water mixtures, for example, to remove water from wet biofuels during production. These membranes dehydrate lower alcohols and show a stable performance in the presence of significant amounts of acetic acid.



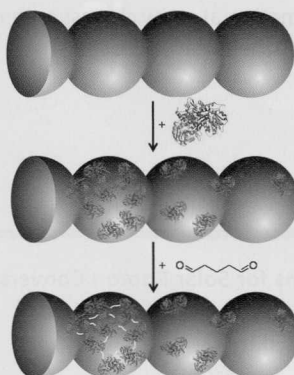
R. Kreiter, M. D. A. Rietkerk, H. L. Castricum, H. M. van Veen, J. E. ten Elshof, J. F. Vente\*

158 – 160

**Stable Hybrid Silica Nanosieve Membranes for the Dehydration of Lower Alcohols**



**No escape:** The formation of cross-linked chloroperoxidase aggregates (CPO-CLEAs) in the pores of mesocellular foam materials results in active biocatalysts that are more resistant to leaching than the conventional catalyst prepared by physisorption of chloroperoxidase. Small-angle neutron scattering (SANS) experiments clearly confirm that the CPO-CLEAs are located in the pores of the mesocellular foams.

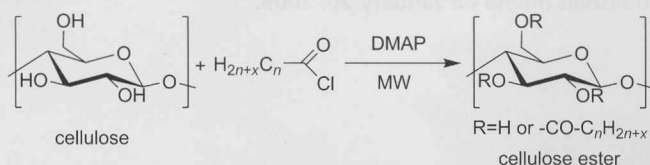


D. Jung, M. Paradiso, D. Wallacher, A. Brandt, M. Hartmann\*

161 – 164

**Formation of Cross-Linked Chloroperoxidase Aggregates in the Pores of Mesocellular Foams: Characterization by SANS and Catalytic Properties**

FULL PAPERS



**Alternative films:** The effect of the chain length and the degree of substitution on the mechanical and hydrophobic properties of various cellulose fatty ester plastic films was studied. The re-

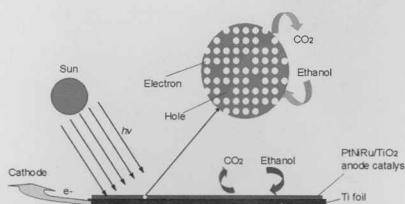
sults suggest that the cellulose ester plastic films are promising alternatives to petrochemical commodity plastics such as polyethylene.

L. Crépy, L. Chaveriat, J. Banoub, P. Martin, N. Joly\*

165 – 170

**Synthesis of Cellulose Fatty Esters as Plastics—Influence of the Degree of Substitution and the Fatty Chain Length on Mechanical Properties**

**Shine a light:** A PtNiRu/TiO<sub>2</sub> anode catalyst for direct ethanol fuel cells shows photocatalytic activity. The peak current density for ethanol oxidation under solar light illumination is 2–3 times greater than that in the absence of solar light. Ethanol is oxidized by light-generated holes, and the electrons are collected by the TiO<sub>2</sub> support to generate the oxidation current.



D. Chu,\* S. Wang, P. Zheng, J. Wang, L. Zha, Y. Hou, J. He, Y. Xiao, H. Lin, Z. Tian

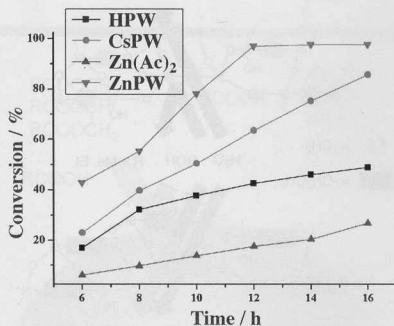
171 – 176

**Anode Catalysts for Direct Ethanol Fuel Cells Utilizing Directly Solar Light Illumination**

J. Li, X. Wang,\* W. Zhu,\* F. Cao

177–183

## Zn<sub>1.2</sub>H<sub>0.6</sub>PW<sub>12</sub>O<sub>40</sub> Nanotubes with Double Acid Sites as Heterogeneous Catalysts for the Production of Biodiesel from Waste Cooking Oil



**Out of the frying pan:** A ZnPW nanotube catalyst containing Brønsted and Lewis double acid sites promotes the conversion of waste cooking oil into biodiesel. The catalytic activity of the ZnPW nanotubes is stable to the presence of free fatty acids or water in the feedstock. The high catalytic activity of the ZnPW nanotubes is attributed to the synergistic effect of Lewis acid sites and Brønsted acid sites.

Supporting information at [www.chemsuschem.org](http://www.chemsuschem.org) (see article for access details).

A video clip is available as Supporting Information at [www.chemsuschem.org](http://www.chemsuschem.org) (see article for access details).

\* Author to whom correspondence should be addressed.

## BOOKS

**Nanostructured and Photoelectrochemical Systems for Solar Photon Conversion** ·

M. D. Archer and A. J. Nozik (Eds.)

**Supramolecular Catalysis** · P. W. N. M. van Leewen (Ed.)

*D. Guldi* ..... 185

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