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CHEMSUSCHEM

ENERGY & MATERIALS

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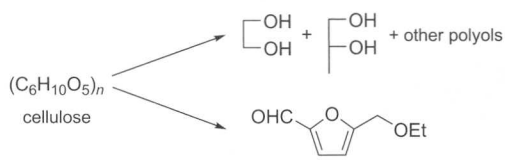
All of the articles in this issue have already appeared online in Wiley InterScience. See http://www.chemsuschem.org under EarlyView®

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_2–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.

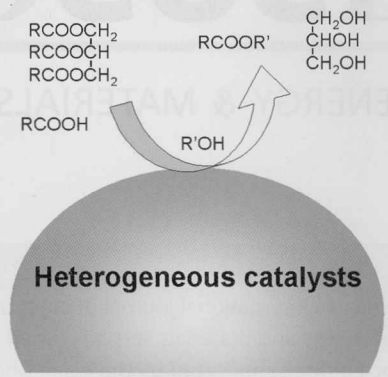
NEWS

HIGHLIGHTS

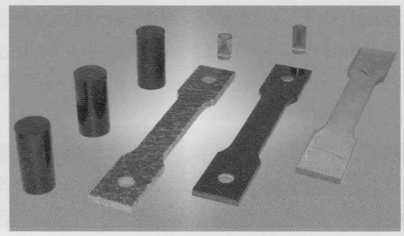


Steering away from alcohol: Fermentation of carbohydrates to ethanol might not be the best way to utilize biomass for the production of fuels and platform chemicals. Two different new remarkable approaches lead to polyols or furfural derivatives.

MINIREVIEWS

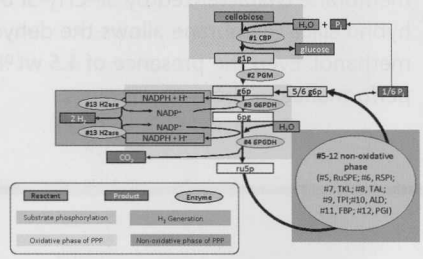


Fuelling the future: The production of esters of higher fatty acids from plant materials is of great interest for the manufacture of biodiesel. Heterogeneous catalysts can provide new routes for the environmentally benign production of biodiesel. Particulate heterogeneous catalysts can be readily separated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

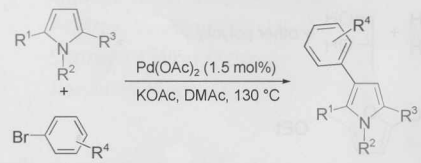


Veggie-based products: Vegetable-oil-based polymeric materials, prepared by free radical, cationic, and olefin metathesis polymerizations, range from soft rubbers to ductile or rigid plastics, and to high-performance biocomposites and nanocomposites. They display a wide range of thermophysical and mechanical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

COMMUNICATIONS

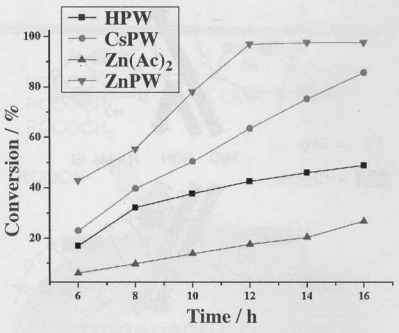


Cocktail reception: Biohydrogen is produced in high yield from cellulosic materials and water in a one-pot process catalyzed by up to 14 enzymes and one coenzyme. This assembly of enzymes results in non-natural catabolic pathways. These spontaneous reactions are conducted under modest reaction conditions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



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 $Pd(OAc)_2$ 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.

FULL PAPERS



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 (see article for access details).

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

* Author to whom correspondence should be addressed.

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