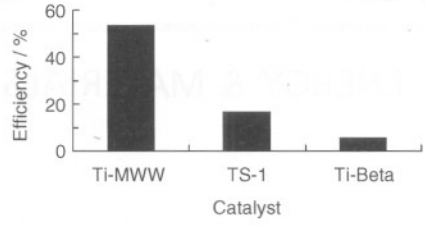
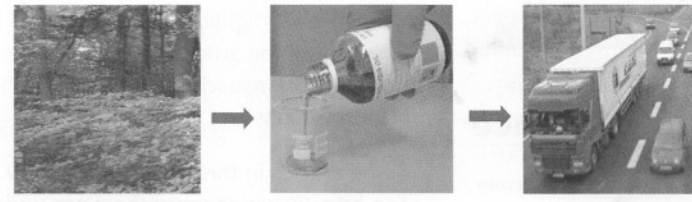
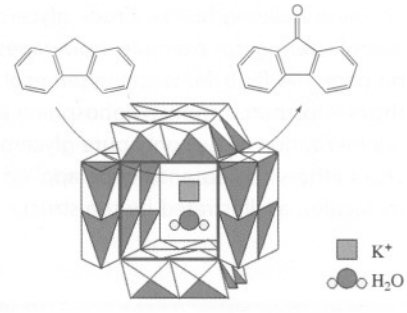
COMMUNICATIONS



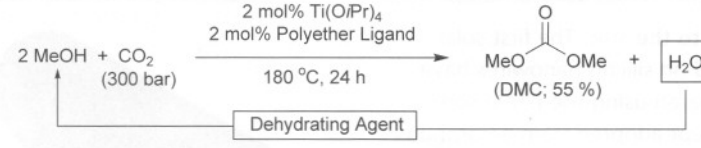
Ti time for dioxane: Oxidation of 1,4-dioxane with aqueous H_2O_2 over various titanosilicates was investigated. Use of Ti-MWW as catalyst leads to much higher conversions than with TS-1 and Ti-Beta under solvent-free conditions and is accounted for by a radical mechanism. The number of active intermediate Ti species is highly dependent on the substrate, solvent, and titanosilicate used.



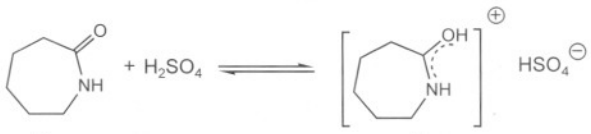
From biomass to tomorrow's biofuels: Pyrolysis oils, obtained by fast pyrolysis of solid biomass, comprise a wide range of oxygenated compounds. It is proposed that after adequate upgrading, these oils may be fed into large-scale refinery units to obtain fuels. Thus, the co-feeding of a model hydrocarbon (C_8) and model oxygenated molecules was studied in a fixed-bed catalytic reactor using an industrial fluid catalytic cracking catalyst.



Sift fluorene into a bowl: Manganese oxide octahedral molecular sieves (OMS-2), with the overall composition $KMn_8O_{16}{\cdot}n\,H_2O$, catalyze the mild, green, and efficient oxidation of 9H-fluorene to 9-fluorenone. The involvement of lattice oxygen species has been implicated in a free-radical chain mechanism. In terms of reaction kinetics, the breaking of the C–H bond is rate controlling.



Run DMC: Homogeneous catalysts based on titanium alkoxides and polyethers were studied for the production of the industrially important intermediate dimethyl carbonate (DMC) from carbon dioxide and methanol (see scheme). The reaction proceeds in the presence of 2,2-dimethoxypropane as a recyclable organic dehydrating agent under supercritical CO_2 conditions.



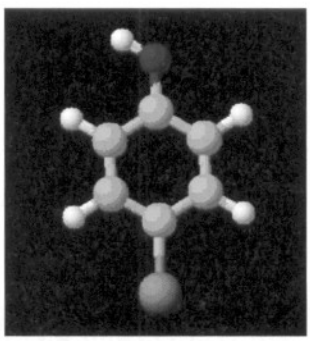
1 2

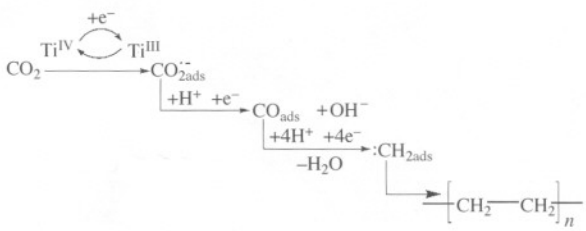
An iconic liquid: Investigation of the mechanism of the Beckmann rearrangement of cyclohexanone oxime to ε-caprolactam (**1**) in sulfuric acid or oleum has led to the conclusion that the manufacturing process for ε-caprolactam is in fact the largest-scale industrial technology that has been using an ionic liquid, caprolactamium hydrogen sulfate (**2**), as the reaction medium for decades.

The chain gang: Crude glycerol, a by-product in the production of biodiesel, can be telomerized with 1,3-butadiene to form C_8-chain ethers. The development of suitable catalyst systems for the direct telomerization of crude glycerol at the biodiesel plant provides a route to useful building blocks from cheap starting materials for commercially valuable products such as detergents and surfactants.

FULL PAPERS

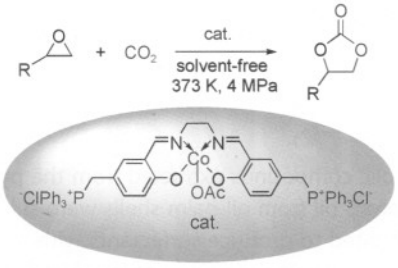
Bromine, bromine, everywhere: Bromination of phenol to 2- and 4-bromophenol takes place upon photolysis of $FeBr^{2+}$ with visible light, under UV irradiation in the presence of $NaNO_3/Br^-$, and upon dark reaction in the presence of H_2O_2/Br^-. Therefore, brominated compounds from abiotic natural sources can be present in the environment, besides those from biotic and anthropic sources.



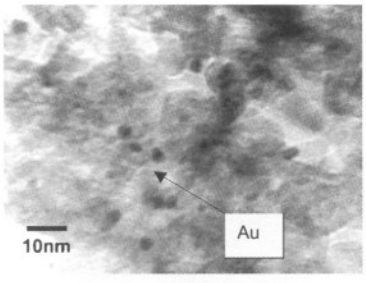


Making polymers out of thin air: The electrosynthesis of low-density polyethylene from CO_2 on a nanostructured TiO_2 film electrode was investigated by controlled potential electrolysis in an ionic liquid–water solvent mixture at room temperature. The TiO_2 film is remarkably efficient and selective for the electrochemical reduction of CO_2.

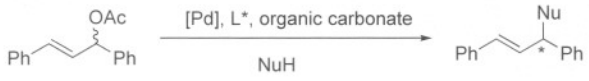
CONTENTS



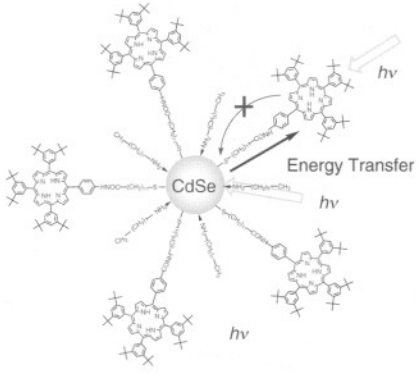
A Co catalyst with no co-catalyst: A bifunctional cobalt-salen complex that contains a Lewis acidic metal center and a quaternary phosphonium salt unit anchored on the ligand has been developed as an active and recyclable homogeneous catalyst for the cycloaddition of CO_2 to epoxides. The catalyst can be easily recovered and reused at least four times without any significant loss in catalytic activity.



A hint of citrus in the air: The oxidation of citronellal to citronellic acid was studied using molecular oxygen in the presence of gold-containing supported catalysts (see image). Detailed studies on the influence of reaction time, pH value, reactant concentration and amount of catalyst show that citronellic acid can be obtained in over 90% yield at pH 12 and a temperature of 80 °C.



An alternative solution: Organic carbonates such as propylene carbonate can be used as alternative solvents to CH_2Cl_2 in palladium-catalyzed asymmetric allylic alkylation and amination reactions. With an appropriate ligand (L*), the enantioselectivity of the reaction can be improved in organic carbonates as compared to those obtained in standard organic solvents.



Array of sunshine: CdSe nanoparticles modified with multiple porphyrin units have been developed as light-harvesting molecules. The CdSe nanoparticle absorbs UV/Vis light and transfers the energy efficiently to the porphyrin moieties. Importantly, the porphyrin excited singlet state is not quenched by the CdSe core, in sharp contrast to the rapid quenching observed for the same porphyrin unit by the metal surface in porphyrin-modified metal nanoparticles.

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.

BOOKS

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