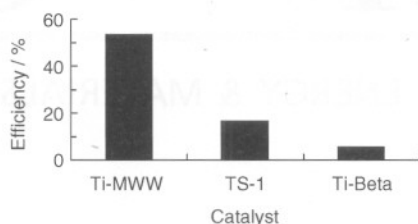


W. Fan, Y. Kubota, T. Tatsumi*

175 – 178

Oxidation of 1,4-Dioxane over Ti-MWW in the Presence of H₂O₂

Ti time for dioxane: Oxidation of 1,4-dioxane with aqueous H₂O₂ 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.

M. E. Domine, A. C. van Veen, Y. Schuurman,* C. Mirodatos

179 – 181

Coproducting of Oxygenated Biomass Compounds and Hydrocarbons for the Production of Sustainable Fuel

**From biomass to tomorrow's biofuels:**

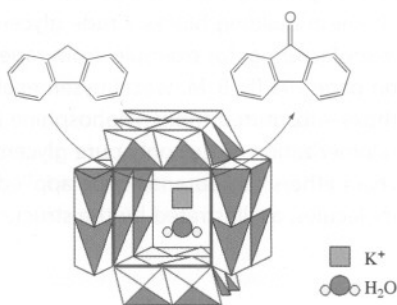
Pyrolysis oils, obtained by fast pyrolysis of solid biomass, comprise a wide range of oxygenated compounds. It is proposed that after adequate upgrading, these oils may be fed into large-scale re-

finery units to obtain fuels. Thus, the co-feeding of a model hydrocarbon (C₈) and model oxygenated molecules was studied in a fixed-bed catalytic reactor using an industrial fluid catalytic cracking catalyst.

N. N. Opembe, Y.-C. Son, T. Sriskandakumar, S. L. Suib*

182 – 185

Kinetics and Mechanism of 9H-Fluorene Oxidation Catalyzed by Manganese Oxide Octahedral Molecular Sieves

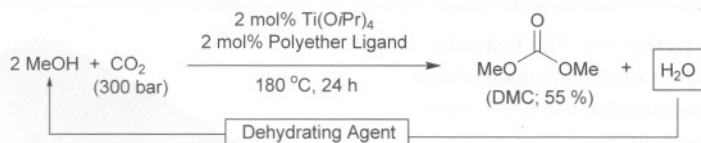


Sift fluorene into a bowl: Manganese oxide octahedral molecular sieves (OMS-2), with the overall composition $\text{KMn}_8\text{O}_{16} \cdot n\text{H}_2\text{O}$, catalyze the mild, green, and efficient oxidation of 9H-fluorene to 9-fluorenone. The involvement of lattice oxygen species has been implicated in a free-radical chain mechanism. In terms of reaction kinetics, the breaking of the C–H bond is rate controlling.

K. Kohno, J.-C. Choi, Y. Ohshima, H. Yasuda, T. Sakakura*

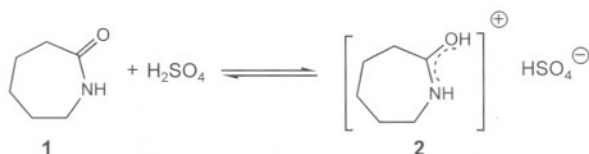
186 – 188

Synthesis of Dimethyl Carbonate from Carbon Dioxide Catalyzed by Titanium Alkoxides with Polyether-type Ligands



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 CO₂ conditions.



An ionic 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 man-

ufacturing 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.

V. Fábos, D. Lantos, A. Bodor, A.-M. Bálint, L. T. Mika, O. E. Sielcken, A. Cuiper, I. T. Horváth*

189 – 192

ϵ -Caprolactamium Hydrogen Sulfate: An Ionic Liquid Used for Decades in the Large-Scale Production of ϵ -Caprolactam

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.



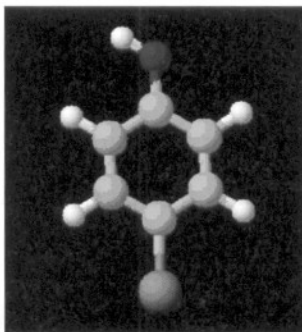
R. Palkovits, I. Nieddu, R. J. M. Klein Gebbink, B. M. Weckhuysen*

193 – 196

Highly Active Catalysts for the Telomerization of Crude Glycerol with 1,3-Butadiene

FULL PAPERS

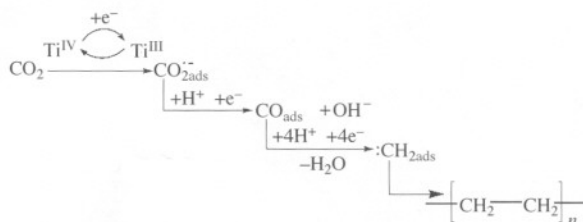
Bromine, bromine, everywhere: Bromination of phenol to 2- and 4-bromophenol takes place upon photolysis of $FeBr^{2+}$ with visible light, under UV irradiation in the presence of $NaNO_3/Br^-$, and upon dark reaction in the presence of H_2O_2/Br^- . Therefore, brominated compounds from abiotic natural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



D. Vione, V. Maurino, S. C. Man, S. Khanra, C. Arsene, R.-I. Olariu, C. Minero*

197 – 204

Formation of Organobrominated Compounds in the Presence of Bromide under Simulated Atmospheric Aerosol Conditions



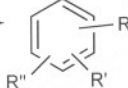
Making polymers out of thin air: The electrosynthesis of low-density polyethylene from CO_2 on a nanostructured TiO_2 film electrode was investigated by controlled potential electrolysis in an

ionic liquid–water solvent mixture at room temperature. The TiO_2 film is remarkably efficient and selective for the electrochemical reduction of CO_2 .

D. Chu,* G. Qin, X. Yuan, M. Xu, P. Zheng, J. Lu

205 – 209

Fixation of CO_2 by Electrocatalytic Reduction and Electropolymerization in Ionic Liquid– H_2O Solution



Shell oil: In the oil industry, water flooding is conducted to enhance oil recovery from low-pressure, depleted reservoirs before other types of flooding are conducted. To this end, surfactants are useful in the oil field. Phenols and phe-

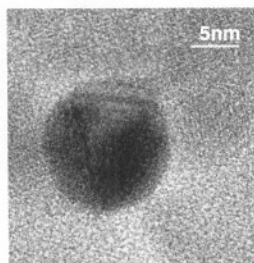
nolic compounds extracted from the pyrolysis oil from oil palm shells were sulfonated to produce surfactants with minimal processing and at low cost for such applications.

M. Awang,* G. M. Seng

210–214

Sulfonation of Phenols Extracted from the Pyrolysis Oil of Oil Palm Shells for Enhanced Oil Recovery

An untarnished halo: Nanoscale Au particles supported on Al_2O_3 (see TEM image) and TiO_2 promote a 100% selective gas-phase hydrogenation of *p*-chloronitrobenzene to commercially important *p*-chloroaniline. The results can serve as the basis for a sustainable alternative route to haloamines.

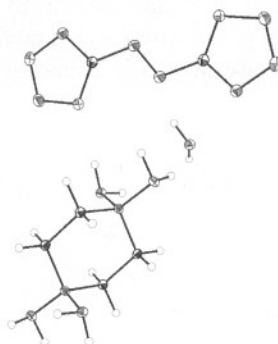


F. Cárdenas-Lizana, S. Gómez-Quero, M. A. Keane*

215–221

Exclusive Production of Chloroaniline from Chloronitrobenzene over Au/TiO₂ and Au/Al₂O₃

High in N-ergy: Several new nitrogen-rich materials with the *N,N,N',N'*-tetraaminopiperazinium cation, such as that with the 5,5-azotetrazolate anion (see structure; N blue, O red, C black), have been prepared in water and characterized. A combination of theoretical and empirical calculations shows that all the salts have high molar enthalpies of formation.

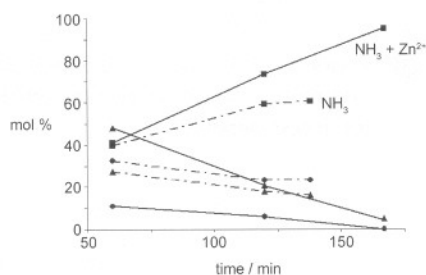


H. Gao, Y. Huang, B. Twamley, C. Ye, J. M. Shreeve*

222–227

Energetic *N,N,N',N'*-Tetraaminopiperazinium Salts

Basic in-zinc: The CO_2 -absorption capacity of aqueous NH_3 is substantially increased (20–30%) by the presence of dissolved zinc(II) salts. The speciation of NH_2CO_2^- (●), CO_3^{2-} (▲) and HCO_3^- (■) was investigated by ^{13}C NMR spectroscopy. The addition at room temperature of a zinc salt to the NH_3 solution at the end of the absorption process releases one-third of the absorbed CO_2 and produces basic zinc carbonates containing the remaining two-thirds of the captured CO_2 .



F. Mani,* M. Peruzzini, F. Barzagli

228–235

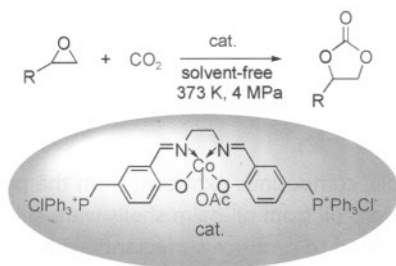
The Role of Zinc(II) in the Absorption-Desorption of CO_2 by Aqueous NH_3 , a Potentially Cost-Effective Method for CO_2 Capture and Recycling

C.-X. Miao, J.-Q. Wang, Y. Wu, Y. Du,
L.-N. He*

236–241



Bifunctional Metal-Salen Complexes as Efficient Catalysts for the Fixation of CO₂ with Epoxides under Solvent-Free Conditions

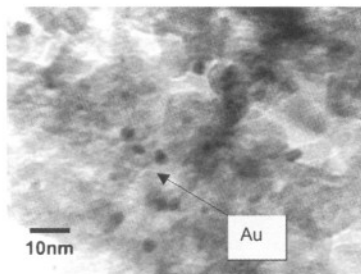


A Co catalyst with no co-catalyst: A bifunctional cobalt-salen complex that contains a Lewis acidic metal center and a quaternary phosphonium salt unit anchored on the ligand has been developed as an active and recyclable homogeneous catalyst for the cycloaddition of CO₂ to epoxides. The catalyst can be easily recovered and reused at least four times without any significant loss in catalytic activity.

A. Martin,* U. Armbruster, D. Decker,
T. Gedig, A. Köckritz

242–248

Oxidation of Citronellal to Citronellic Acid by Molecular Oxygen Using Supported Gold Catalysts

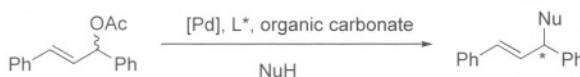


A hint of citrus in the air: The oxidation of citronellal to citronellic acid was studied using molecular oxygen in the presence of gold-containing supported catalysts (see image). Detailed studies on the influence of reaction time, pH value, reactant concentration and amount of catalyst show that citronellic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

B. Schöffner, J. Holz, S. P. Verevkin,
A. Börner*

249–253

Organic Carbonates as Alternative Solvents for Palladium-Catalyzed Substitution Reactions



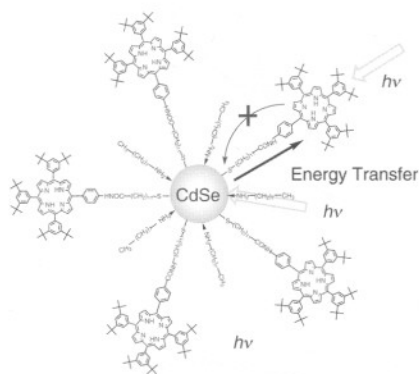
An alternative solution: Organic carbonates such as propylene carbonate can be used as alternative solvents to CH₂Cl₂ in palladium-catalyzed asymmetric allylic alkylation and amination reactions.

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.

S. Kang, M. Yasuda, H. Miyasaka,*
H. Hayashi, M. Kawasaki, T. Umeyama,
Y. Matano, K. Yoshida, S. Isoda,
H. Imahori*

254–261

Light Harvesting and Energy Transfer in Multiporphyrin-Modified CdSe Nanoparticles



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

Catalysis for Renewables · Gabriele Centi and Rutger A. van Santen (Eds.)

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<http://www.chemsuschem.org>

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